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USSR Report

NATIONAL ECONOMY



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NATIONAL ECONOMY

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FORESTRY, TIMBER

BUSYGIN ON INDUSTRY LAG, RESTRUCTURING

Moscow LESNAYA PROMYSHLENNOST in Russian 22 Nov 86 p 1

[Speech by Deputy M. I. Busygin to the Sixth Session of the USSR Supreme Soviet, 11th Convocation: "It is Necessary to More Actively Restructure"]

[Text] Dear comrade deputies. The draft of the State Plan for the Economic and Social Development of the USSR and the USSR State Budget for 1987 presented to the Supreme Soviet for examination, completely responds to the 27th CPSU Congress' strategic course for the development of the Soviet economy during the 12th Five-Year Plan. This also applies to the section on the Timber, Pulp and Paper and Wood Processing Industry.

This year there have definitely been advances in the forest industry's work. At the same time we far from overestimated what has been done, and clearly acknowledge what we owe to the national economy, our shortcomings and oversights. Most enterprises and the ministry in general are still working unevenly, advances alternate with drops in production. We were not able to achieve restructuring's main goal -- that of assuring stability and reliability in the work of each labor collective. During the summer the industry was not able to maintain a high pace for logging operations. This had a negative effect upon wood processing enterprises and upon the supplies of wood products to the national economy. Even more unfortunately, sales levels, including delivery obligations, for the first 10 months were only 97.6 percent met.

In preparing for the five-year plan's second year the ministry is concentrating its main attention upon lagging sections, upon searching for additional reserves to improve production efficiency and to maximally satisfy the national economy's growing demands for the sector's products. It is foreseen that the production of mass consumption goods will be 500 million rubles higher than control figures. The plan calls for pace setting growth rates in the production of effective substitutes for commercial timber. These include cardboard, plywood and panels from processed wood. The realization of the measures intended to improve the technical levels of production in the timber, pulp and paper and wood processing industry will make it possible to free 35,000 people and reduce production costs of commercial output by 110 million rubles in 1987.

By using various sources of financing there are provisions to increase investment levels in the production of mass consumption goods such as furniture, wallpaper, and paper products. It is intended to increase the growth rates of wood processing in the Far East.

A number of important organizational and technical measures are needed to realize the plans for the second year in the five-year plan. The conversion of all industrial enterprises in the sector to the new operating conditions next year is of primary importance. Their efficiency is proven by work experience at a number of our large production units in the Belorussian SSR and Lithuanian SSR ministries, the Tesntromebel [Central Furniture] Karellesprom [Karelian Forest Industry] and Tyumenlesprom associations and the Balakhinin Cellulose and Paper Combinat, which are already working by such principles. The ministry is now completing preparatory measures. Product quality improvements will be the main goal. This very important state task was the subject of basic discussions at the recent CPSU Central Committee conference. At the ministry in 1987 state acceptances are being introduced at 60 enterprises. Therefore, since last month we have been gradually expanding the coverage of products by state acceptances, with a view to increasing them to 100 percent by the start of 1987.

Multipurpose, year-around forest enterprises, involved in forest reproduction, logging, and wood processing will be further developed. Today there are more than 120 such enterprises in the sector. We are giving them the task of assuring the harmonious combination of forest use, reforestation, and multiplication of forest wealth on a higher organizational, technical and social level. The most active, persistent and systematic methods will be used to increase the shift coefficients of new, highly productive equipment, to convert enterprises to continuous operation, with days off on a sliding schedule, use the rotating assignment system at logging camps at every place where there are conditions suitable for this system, extensively introduce cost accounting forms for labor brigade organizations, disseminate the experience of progressive collectives and improve the working and living conditions of workers in the sector. At the same time I would like to note that the realization of these measures is sometimes negated by the poor reliability of the machinery and construction equipment delivered us, especially integrated machines.

In evaluating the situation in the sector, I want to stress that in general we are not satisfied with our work. We understand that we have still not solved all the tasks in completely meeting the national economy's requirements for wood and paper products. Acknowledging this, comrade deputies, we will continue to diligently work to find reserves for improving production efficiency and fulfilling the 1987 plan to deliver high quality products.

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FORESTRY, TIMBER

BSSR, LISSR PAPER INDUSTRY EXPERIMENT EXPLAINED

Moscow LESNAYA PROMYSHLENNOST in Russian 6 Nov 86 p 2

[Interview with Ye. Romanenko, deputy chief of the Planning and Economic Administration, USSR Ministry of the Timber, Pulp and Paper and Wood Processing Industry, and management officials in associations and plants under the ministry, by S. Litvinov: "Learning to Count"; first three paragraphs are source introduction; last paragraph is source conclusion]

[Text] Is it really rare that some people work fervently and only receive as much as average workers? Where an enterprise earns sizable profits but it is less able to provide workers with apartments than one which is losing money? One plant makes goods which sell like hotcakes, but its bonuses are the same as one whose goods are gathering dust on the shelves. Alas! Today this is not so rare.

In order to eliminate these and other contradictions, the measures for improving the economic mechanism outlined by the 27th CPSU Congress are now being implemented. One of them is the conversion to new operating conditions.

A number of labor collectives in the paper industry are working in the new manner this year. What are the first results of the experiment in pulp and paper enterprises in Belorussia and Lithuania? This was the subject of a "Telephone Bridge" interview with L. Mishkinis, general director of the Grigishkes Association, K. Murauskas, his deputy for economics, Ch. Rimkus, deputy director for economics at the Klayped Cellulose-Cardboard Plant, V. Veretin, chief economist, Belbumprom [Belorussian Paper Industry] Association, and Ye. Romanenko, deputy chief of the Planning and Economic Administration, USSR Minlesbumprom [Timber, Pulp and Paper and Wood Processing Industry]

[Correspondent] The experiment has been in effect for several months at your enterprises. Can you say that you are now working differently than before?

[Rimkus] We are now required to work more precisely and diligently. Everybody knows that the plan must be unconditionally fulfilled. If we are not supplied with raw materials we cannot make cardboard. If there is no cardboard no shoeboxes can be made, if there are no boxes there will be no products in the stores. However, it is one thing to understand the damage from lack of

coordination, but quite another to receive rewards tightly linked to the fulfillment of delivery plans. We were obligated to all customers and in nine months received an additional 40,000 rubles in our funds.

[Correspondent] Hello, Minisk and Grigishkes, can you boast of such punctuality?

[Murauskas] Yes.

[Veretin] All paper enterprises in Belorussia met their delivery plans. The increasing rewards for meeting obligations were, to a great extent, responsible for our workers' earnings increasing by 2.7 percent over last year.

[Correspondent] Klayped. You said that the experiment forces you to show more initiative. What did you have in mind?

[Rimkus] The experiment forces the collective to look for possibilities for increasing commercial output. This means finding reserves. How? Our plant has reached planned capacity. Its production processes are continuous, but in spite of this we installed a line for processing cardboard, making attractive matchboxes. We found a previously untapped market for such products.

[Correspondent] Thank you. Now it is time for a word from your colleagues at Grigishkes.

[Murauskas] I agree with the Klaypeders, the experiment requires boldness and more precise actions from all services. Here is an example. At the beginning of the year, recalling that supplies were not distinguished by great punctuality, our suppliers built up a large reserve of raw materials for the combinat. The experiment required that we pay a fine amounting to three percent of the value of above-norm reserves. The material incentives fund was short by a solid sum. This also had an effect upon bonuses.

[Veretin] The experiment also helped free us from above-norm carryovers of equipment and raw materials...

[Correspondent] Please, let me interrupt you to explain to reader who are not economists why above-norm reserves of raw materials and equipment are not good.

Imagine, comrade reader, that you purchased an electric meat cutter, but are not using it. This is nothing terrible, but first, you have used money which you could spend on other things. Secondly, you have taken an object from the market which perhaps could be very useful to someone.

[Veretin] To continue your culinary example. Imagine that the meat cutter owner has to pay a fine for the unused unit. Then, that owner would want to get rid of it. While at the start of the year Belorussian Paper Industry enterprises had 2.6 million rubles worth of above-norm commercial and material

goods, now they have less than half that. The experiment forces us not to be a Gobsek [not further identified] and sit on a packing box, but to put these goods into circulation.

[Correspondent] Here is a question to all participants in the "Telephone Bridge": What are the advantages to working in the new way?

[Mishkinis] Savings in the wages fund. If we don't attain them this year, we can use them next year. In addition, markups for high skills have been established not only for workers but also for management personnel.

[Veretin] We feel that we have become more independent, granted, only a little bit, but all the same... We ourselves compile the assortment program. At the year's end we can sell above plan products at our own discretion. Correspondence was reduced.

[Murauskas] It was reduced? You are lucky. Ours was not.

[Correspondent] Why? As you know, in the experiment it is written that the number of report indicators is to be cut in half.

[Romanenko] Only about 15 percent of our enterprises are yet covered by the experiment. Therefore the center still requires the same data from local units. One more point: reports are often invented by various units in order to justify their existence. As Mikhail Sergeyevich Gorbachev stated in his meeting with workers in Krasnodar Kray, in order to reduce correspondence it is necessary to reduce the size of the management apparatus.

[Correspondent] We have unwittingly touched upon problems linked to the experiment. Let us mention them briefly?

[Rimkus] Precision is needed not only by labor collectives, but also by central organs. The lack of organization which they show does not do anybody any good. USSR Gosstandart [State Committee on Standards] has removed the mark of quality from cardboard boxes. This means that beginning next year we will not receive more than 300,000 rubles profit. This is right, one must fight for quality. But how? Standards have still not been created for new cartons. Paper is delayed and this costs hundreds of thousands of rubles.

[Mishkinis] Not enough is allocated to the production development fund and they are not deployed. Especially in the pulp and paper industry, where the cost of equipment is in the millions.

[Romanenko] Excuse me, but directors have other possibilities for technological renewal. First of all, the experiment authorizes Gosbank credits of any amount. For construction, perhaps. Secondly, enterprise managers can show that investments in reconstruction will be more efficient than new construction. Then they will be financed through the ministry's centralized funds. If they so dare.

Judging from today's conversation, the experiment has already been beneficial to the pulp and paper industry. True, only the first reservoirs have been discovered. There are still a lot of problems, but this conversation once again shows that the 27th CPSU's program to expand enterprise independence is on the right path.

FORESTRY, TIMBER

SUPPLY, DISTRIBUTION PROBLEMS FLAW TIMBER SECTOR

Moscow LESNAYA PROMYSHLENNOST in Russian 1 Nov 86 p 2

[Article by Ya. Godgildiyev, engineer: "A Gap in the Defense"]

[Text] This five-year plan enterprises in the Belorussian SSR Minlesbumprom [Ministry of the Timber, Pulp and Paper and Wood Processing Industry], Karellesprom [Karelian Forest Industry] and Tyumenlesprom began the economic experiment. They are working under a new system for planning and stimulating production. Starting next year, all sectors in our all-union ministry will be officially converted. There has been very little time to figure it all out, but, unfortunately, there are numerous problems which must be solved. It is now especially important to eliminate the "painful knots" in planning deliveries and distributing wood supplies. It is here that the restructuring is impermissibly slow. This is the subject of this article.

Who is Tying the Knots?

Starting next year the delivery plan will become the main indicator for enterprise activity. There is no denying that this threatens to be a serious change. However, judging from the present situation one cannot talk of any preparations for it. The most complex knot of problems back at the start of the year was tied at the upper planning levels, the ministry and Soyuzglavles [Main Administration for the Supply and Sales of Forest Products].

Take, for example, the section for planning deliveries for "one's own needs", Understandably, each association has an interest in obtaining as much as possible "for this part". However, this interest is not "selfish" -- the increased attention to the human factor, dictated by the 27th CPSU Congress, requires that more housing be built and cultural-personal services be developed. Yes, and the local processing of felled timber must be speeded up, and this is not just our own needs.

In short, we want to satisfy the demands of customers in a large market and not harm ourselves. However, how does one embrace the unembraceable? Worldly wise sales and supply people say: "The timber supplies must be protected skillfully..." "Tell me from who they must be protected, who is encroaching upon them?" -- asks the uninitiated reader. Alas, cut timber supplies are

wanted -- and there is readiness to wait for them. However, I understand the naive reader. Hundreds of workers in sectorial science are engaged in norming raw material consumption. These norms are also approved at high levels. It seems that it would be simpler to use these norms to allocate cut timber supplies for the planned production volume. However, sales and supply workers would then be deprived of the "pleasure" of trading a little. This is truly a dramatic effect, a painting or good writing. Although we cut a lot of wood, there is never enough. Well, it is fun to protest supplies, shades of Trishka's Kaftan [a Krylov fable in which curing one leads to the corruption of another]...

However, behind the "defensive" process, the ministry allocates cut timber supplies. Are there enough for our own needs? A utopian hope... As they say, not the best we could hope for: if only they would approve these levels. "Defend it, sire!" -- cries the next attacking unit -- Soyuzglavles. Its "scissors" are bigger and sharper. Then territorial organs enter the affair. These are Lenglavsnab [Leningrad Main Supply Administration], Lenlesbumstroysnabsbyt [Leningrad Timber and Pulp and Paper Construction Supply and Sales Administration]. They cut and cut. All reasonable arguments only receive nods: the Ministry -- to Gosplan, Soyuzglavles -- to Gossnab. Thus, the knot is tied and we take the entire year untying it.

Well, one can still put up with a shortage of supplies. Clearly, this will not take away life's pleasures. However, doesn't an enterprise have the right to be master of what is allocated to it. After all, it is more obvious to people on the spot how to dispose of wood, where to send it first and who can wait a little. But nobody reckons with us. First of all, cut timber supplies, counted in tens of thousands of cubic meters, are bundled in "lumps" of 50 and 100 cubic meters each. It turns out that until the year's end nobody at the association knows what they possess.

Moreover, cut timber supplies change several times during the year: they decline or increase, one assortment is replaced by another. The ministry's forest supply administration does not explain the motives for such perturbations. And in Lenglavsnab one is simply presented the facts.

Also, from all sides there is the demand: "Even if you have to sweat blood, fulfill the assortment plan!" How can one meet the target for sawing lumber, if, instead of roundwood we are given pulpwood? In general, everything is done in order to confuse the supply situation. Later, one of the planning organs is concerned: only approximate the supply mark for the total cubic meters allocated. In general, our defense is solid nowhere, it is full of breaches.

JUMP ABOUT, OR CRY, IF YOU LIKE

After such "planning" I would like to find a manager who could avoid "stepping" beyond the limits on cut timber supplies for his own needs. As is known these are a "thing in itself" for us the entire year. But housing, hospitals and clubs must be built and wood processing continued. Customers also must be supplied with wood. Like it or not, you take it from their "pockets". But this does not go unpunished: presto, and a fine...

You might ask, to whom is this advantageous? As humorists joke, the question is, of course, interesting. However, so far nobody has answered it and the vicious practice continues. Lack of information on "their owners" complicates the arrhythmia of their allocation. Here is an example. This year Novogorodles was allocated 170,00 cubic meters of broadleaved saw timber. How much was released by quarter? In the first quarter -- 120,000! Are our wood processing enterprises really able to immediately receive such a quantity of timber? This is to say nothing of using it in such a short time. It is no surprise that there is confusion in the use of specialized rolling stock: at the beginning of the year there is not enough, while later it sits idle.

In general, one would like to avoid surprises. It is a pity that nobody learns any lessons from these planning flaws. For the production of containers, last year we were allocated, starting with the second quarter going through the end of the year, 30,000 cubic meters of round timber and 20,000 cubic meters of lumber. In the fourth quarter, when we had already used this, it was "explained" that these cut timber supplies were annuled. This means we had already unlawfully used excessive amounts of forest products. And, of course, fines did not make us willing to wait...

Who is guilty here? It is known that planning organs and workers at Lessnabsbyt are. But we must get out of the mess -- the overconsumption of wood supplies and failure to deliver... Perhaps there can be some kind of punishment for some of these "correctors"? If only! This is why there is no confidence that you possess any specified amount of lumber. We live in constant expectation that somebody sometime will encroach upon them.

This September Lenglavsnab "made us happy": the supplies of coniferous lumber for the second half of the year, already limited, were cut by 44 percent. And they had to be supplied to a large market in the form of houses, furniture, wooden blocks and other products. "You must deliver without fail!" they demand at Soyuzglavles. You might ask, from what will all this be made. It is like the saying: "Go there, you know not where"...

Do you think that this ends the mishap of the supplier? Alas, he has another entire "package" of requirements for saving timber. See how wily a manager must be? But no matter what he does, he can't avoid fines: they lie in wait at each step.

What is the solution? It is clear, first of all, that supplies should have one owner -- the ministry. They should also be handed down to enterprises in a final variant: in assortments, by quarters, and in the form of an order-schedule. Secondly, all this must be balanced with production plans and a timely schedule must be assured. We are by no means thinking about trying to haggle for lax norms for raw material use. Let them be strict, but realistic. Everybody -- from top to bottom -- gains from this. Storming will subside and work rhythms will enthusiastically respond. I hope that our comments and suggestions will be objectively received, without trifling grudges, at the USSR Minlesbumprom's forest products sales and supply administrations. After all, we all have the same task -- to accelerate the restructuring process and honorably implement the decisions of the 27th CPSU Congress.

HOUSING, PERSONAL SERVICES

PROPOSED IMPROVEMENTS IN HOUSING CONDITIONS OUTLINED

Moscow LITERATURNAYA GAZETA in Russian 24 Sep 86 p 10

[Article by L. Velikanova: "A Separate Apartment for Every Family"]

[Text] In the next three five-year plans a highly important social problem will be resolved -- virtually every family will be provided a separate apartment or home of their own. By the year 2000 it is planned to build dwellings in the total amount of at least 2 billion square meters of floor space.

What is the basis of this estimate? How many residences must be erected? How many buildings must be demolished or replaced? Is it necessary to mount a special effort in housing construction, or can we proceed in the normal evolutionary manner?

What proposals are being made relative to kinds of houses to be erected in the city as opposed to rural areas?

What about number of stories and floor plans of apartments? Has due consideration been given to the demographic situation in the country, republics and cities?

Has it been decided where the houses will be built -- on new sites or on sites cleared by tearing down old structures?

What will be the source of funds for residential construction? What will be the relative share of state-financed, cooperative and private construction? What role is assigned to youth residential complexes?

What body will control the resources -- local soviets or enterprises, i.e., will construction be managed according to the territorial or the branch principle?

Has thought been devoted to a fair system of managing

and assigning apartments and to rental amounts?

Answers to the above questions, submitted by LITERATURNAYA GAZETA reviewer L. Velikanova, are provided by D. Khodzhayev, Deputy Chief, Residential and Communal Economy Department, USSR Gosplan.

How Many People are on the Waiting List?

Historically speaking, it is possible to divide the resolution of the housing problem in our country into three phases. The first starts at the October Revolution and ends at the Great Patriotic War and the period of restoration of the national economy. The second commences in 1957 and extends until the 28th CPSU Party Congress. The third, which came into being after the Congress, should last until the year 2000. This division is somewhat crude and arbitrary, of course, but it is necessary.

Efforts were made from the very first days the Soviet system came into being to resettle laborers' families from basements and barracks. However, the housing available in czarist Russia amounted to only 180 million square meters of total living space, 80 per cent of which consisted of wooden houses, which lacked elementary conveniences at that. Thus, there was actually little resettlement that could be done.

Housing construction showed continual development, but only on a relatively small scale, since the country was occupied with solving urgent problems of industrialization.

The year 1957 saw the passage of the historic decree relative to development of housing construction in the USSR, after which the rate of construction of residential housing underwent an abrupt increase. Construction in the first 40 years of the Soviet system totalled 20 million apartments (or 1 billion square meters of living space), while in the next 30 years (from 1957 to the present) the gain was 65 million apartments (or 3.5 billion square meters).

In this connection, often asked is the question: If we are doing so much building, why does the housing problem continue to be so serious? Because at the same time our country was undergoing a transformation from a backward agrarian nation into an advanced industrial country, the populace was migrating to the cities in enormous numbers. In 1917, 18 per cent of the population lived in cities, whereas today that figure is 65. Thus, the total urban population rose by 150 million people. We were unable to keep up with this large migration, regardless of how much building we did.

How were we able to make a substantial gain in 1957 in solving the housing problem? By moving away from erecting single buildings, using individual plans, to adoption of the standardized industrial method. Otherwise, we of course could not work to such a scale to build steadily, adding 500 million square meters of living space during each of the 6 five-year plans. It is true that serious errors were made during the industrialization and standardization

process. In striving for quantity we lost sight of quality.

The inexpensive five-story buildings, which were all the country could afford at the time and which "hailed" us out of the tight spot, are not without their detractors: the rooms are arranged such that one must go through a room to get to another room; kitchens are tiny; ceilings are low; and there are no anterooms at all.

In 1969 a decree was passed to effect fundamental improvement in quality of residential construction. A key provision in this regard was a modification in the floor space factor, in that the square meterage of living space was dropped in favor of the square meterage of total floor space, a change which "emancipated" designers.

Also improved were apartment layouts and construction features of buildings, including heat and sound insulation. Utility rooms became larger. However, the actual amount of construction accomplished showed little increase, since each building and each square meter became more expensive.

During the 7th Five-Year Plan the government invested 40.5 billion rubles in housing construction, but in the 11th, the figure rose to 98 billion -- the amount more than doubled. However, new housing increased by only about 1.4 times.

Where do we stand now?

All the available housing in the country amounts to about 4 billion square meters of total space. Of this total, 2.5 billion are city type residences, while 1.5 billion are of the rural type. Concerning ownership, 2.5 billion square meters come under the so-called collectivized housing -- the state-owned or cooperative buildings; 1.5 billion of the remaining amount are privately owned, belonging to citizens (located as a rule in rural areas, small towns and urban-type settlements).

In this connection, more than 80 per cent of the urban population lives in individual apartments. The average living space per person as of 1 January 1986 measured 14.6 square meters (14.1 in cities; 15.7 in rural areas). This factor is highly variable -- from republic to republic, for example. There are considerable differences between cities and within a particular city. In Moscow the average living space per person is already approaching 18 square meters, but at the same time there are very many people on the waiting list who are desirous of improving their living conditions.

How much residential housing must be built
to accomplish the task set by the Congress,
and how can we arrive at an estimate?

It would seem that nothing could be simpler. All you have to do is estimate how many people there are on the waiting list in the country, add to this a forecast of how many more people will be on the list in the next few years, and you have an easy answer of how much residential housing must be erected

to satisfy the demand. Alas! -- this estimate is useless.

On the one hand, if we take the above as a basis we may underestimate the need, since at the present time those who are placed onto the waiting list consist either of people who have no residence at all or families in which each member is reckoned to have less than the so-called "reduced" norm (in Moscow this amount is 5 square meters of living space, while in some other cities the figure is 6 or 7). Here is an example. Assume that in a room measuring 30 square meters there are 5 occupants -- a mother, father, daughter, her husband and a child. Will they be put on the waiting list? Not everywhere. And there are clearly two families here who, additionally, urgently need improvement in housing conditions, since they are living in a single room.

On the other hand, an estimate based on the "waiting list" may be overestimated, since each family member who works and needs living quarters has the right to be put on the waiting list through the enterprise where he works. In other words, each person could be counted twice, three times, etc. In a word, this approach is useless.

What are we to do?

Everyone has become accustomed to measuring living space in terms of square meters of total area. Attempts have been made to compute the number of square meters that would be required per person to provide all families with a separate apartment. This kind of approximation was made on the basis of careful research (which even included estimates of the floor space that will be taken up by furniture in future apartments). It was eventually found that to realize the principle of "a separate apartment for each family", the total space required per person would be 18.5 to 19 square meters. In cities the amount would be somewhat smaller, in rural areas a little larger. This estimate is the basis of the amount "at least 2 billion square meters" which is recorded in the Basic Directions for Economic and Social Development of the Country.

It must be stated, however, that even this reckoning is not altogether reliable, of course. If we divide the billions between the city and the rural area, the result shows that in the rural area each family will receive a house or apartment in the near future, whereas in the city this situation will not obtain even by the year 2000.

If we make the division by republic, the need for additional residential construction is even greater.

All this speaks of the fact that we cannot proceed in the evolutionary manner; we need to make a substantial gain, the kind that was made in 1957. While during the preceding 6 five-year plans we increased the amount of residential construction by about 10 to 15 per cent, at the present time we must effect a similar increase in only one five-year plan. Perhaps even a greater gain. And we must continue to make progress at this rate. This is the important thing.

One-Room Apartments Will Not Be Required

We need a psychological realignment. Even the basic factor used in residential construction planning -- the number of square meters of total space -- is no longer completely responsive to the assigned task. Why? It has been estimated that in Moscow alone it would have been possible to provide housing for several thousand more families with the same amount of money and in the same time period if the residential structure (number of one-room, two-room, etc. apartments) reflected the demographic structure. Since this was not the case, it was necessary to provide a space larger than we can presently give or adopt the communal plan.

In the Central Asiatic republics, on the other hand, there are many large families, with 8, 9 and more members in each. And we are building three-room apartments. In short, it is sometimes necessary to assign a family three apartments (including three kitchens, three toilets, three bathrooms).

It is obvious that in the future we will have to modify the square meter space factor by adding a new apartment factor and, in republic plans, also an apartment type factor.

At one time we were slow in dropping the square meter living space factor in favor of the total space square meter factor and instead built many "excess" buildings and apartments of poor design. We can make another mistake now, if we do not start planning for number of apartments, not only number of square meters.

We are presently faced with a shortage of one-room apartments in cities. Conclusion? Let us build this kind of apartment and the problem will be solved. Once again this is not as simple as it sounds.

At the present time we distribute housing according to the formula "the number of rooms is equal to the number of people in a family minus one". A family consisting of two people is assigned a one-room apartment; one of three members, a two-room apartment; one of four members, a three-room apartment. In the future the average living space per person will be increased and more generous assignments can be made. Estimates show that a more liberal distribution principle will lead to a shortage not of one- and two-room apartments, but of the three-room kind. If during these years we build one-room apartments, a commodity in short supply at present, by the year 2000 there will be no applicants for such housing.

What are we to do? Just now we must give some preference to one-room apartments (while taking regional differences into account), but we must continually change the structure of residential construction, especially as we approach the last five-year plan of the twentieth century.

Let me summarize. We must construct a total of at least 30 million apartments in the country. Of this total, something more than 20 million should be built in cities, 10 million in rural areas.

In the final analysis, the exact number of apartments needed can be determined in a scientific manner after the 1989 population census is completed, since the count will include a characterization of housing conditions.

Kitchens of at Least 8 Square Meters
and Ceilings at Least 2.7 Meters High

There has been much discussion of what the rural type house should be like. About 95 per cent of houses being built in rural areas will be of the single type, with the one-floor or two-floor plan. Only 5 per cent (located primarily in suburbs of large cities) will be of the multi-story city type.

In cities the problem is more complicated. This is due mainly to the fact that these plans are all different -- they could be large, average, small, or urban-type settlements. Each one is travelling on its particular route of progress. Low buildings (including those made of local construction materials) in urban areas account for 5 per cent of the total for this group. This amount is due to increase by the end of the century to about 10 per cent.

Construction of five-story buildings must be reduced. Installation of elevators in these buildings is uneconomical, as we know, but since living in them without an elevator is inconvenient, the emphasis must shift to erection of four-story buildings. Four- and five-story buildings, presently accounting for 40 per cent of total residential construction, will drop to 25 per cent.

The major type of building in cities will be the nine- and ten-story type, with an elevator installed in each section. They will account for approximately 50 per cent of total residential construction. Buildings higher than 10 stories with two or three elevators will constitute 15 per cent.

I can state in all sincerity that the apartments we are building today are every bit as good in their layout as apartments being built on a large scale in any country of the world. Those which we are constructing in Moscow in many cases are even superior.

Average floor space has increased substantially. We now have a standard minimum space for rooms and kitchens: in new buildings they cannot be smaller than 8 square meters. Ceiling height in the new standard designs has been increased to 2.65 to 2.7 meters.

What is planned relative to location of residences within cities? Will new sites be used or will old and dilapidated buildings be pulled down to build in larger measure in the center of cities? There is a single answer to this: both methods will be used in combination; a judgement will be made in each case.

If we decide to abandon reconstruction altogether, the use of new building sites will be associated with very heavy outlays for transportation and for services of a commercial, domestic, and cultural nature. On the other hand, the destruction of housing which is still suitable for use is also unthinkable. There also would be the major effort of resettling the people being evicted; the net increase in housing would be very small.

In a word, it is planned to increase the density of construction. This plan, in addition to other advantages, will lead to the restoration of the yards which would otherwise be lost, yards which as we know make life more difficult if they are not available.

Housing Construction Cooperatives, Youth Residential Complexes and Others

In the last five-year plan we built 552 million square meters of living space. Of this total, about 400 million was built with state-furnished and public funds; 33 million were built by residential cooperatives; 35 million by kolkhoses; and 80 million, by private financing.

The situation is changing.

First, it is understood that an increasing part of state-financed residential construction will be assumed by funds which are being set up in enterprises which are operating under new management conditions. In this regard, improvement in housing conditions is closely linked to the labor contribution made by the collective and the individual worker, a feature which constitutes an additional incentive for excellence in work.

The above is more than just good intentions. The Politburo of the CPSU Central Committee recently approved the initiative of Gorky Motor Vehicle Plant workers, whereby under conditions of the new management methods it is permitted to effect substantial increases in capital investments for housing construction, thus making available a separate apartment for every plant family as early as 1995. It will be well if this initiative will be adopted as widely as possible.

Second, with the rising quality of construction and associated higher construction costs, the government can no longer take on all the expenses.

Third, personal income has risen substantially, thus enhancing the possibilities of personal participation in the resolution of the housing problem.

For this reason, the amount of participation by the individual will constantly increase. The privately-owned residence is a reliable way to endow a person with stable roots. This is why an entire system of benefits has been developed for private construction in rural areas. A tractor or combine operator, for example, need only pay down 10 per cent of the cost of a house, and for the amount remaining he is given credit (for 25 years). In addition, half the remaining debt is liquidated by the organization where he works.

Benefits associated with cooperative construction are also on the increase. The first share payment previously amounted to 40 per cent of apartment cost, but now it is 30 per cent. In remote areas of Siberia and the Far East, this share is 20 per cent. Previously, a credit balance had to be paid off in 10 to 15 years, but now the term is 25 years. Enterprises and other organizations have been granted the right to take over a part of the primary loan payment and the credit balance of outstanding workers. Thus, the cost of a cooperative

apartment can be paid to a considerable degree -- to 35 per cent and more -- out of funds provided by the enterprise. This will also serve as an additional work incentive.

The present five-year plan is already seeing almost a doubling of cooperative construction. ZhSK [Zhilishchno stroitelnyy kooperativ -- housing construction cooperative] construction presently amounts to 8 per cent of residential building, but in the 14th Five-Year Plan virtually every third house will be built by these cooperatives.

Let me say a few words about youth residential complexes. Some -- and rather large ones at that -- have already been built. They are located in Sverdlovsk, Kaliningrad, near Moscow. This style appeals to many people. Several hundred MZhK [Molodezhnyy zhilishchnyy kompleks -- Youth residential complex] groups have been registered. **These complexes** do require support, of course. However, there are those who oppose this, asking: "Why should young people be granted such privileges?" Since we know that the total amount of residential construction is not changing, young people must be obtaining apartments at the expense of people on the waiting list.

This is not quite so. No MZhK can be erected without the approval of the labor collective. Thus, the collective itself decides whether or not it is reasonable to make it possible for outstanding working youth to employ its own capabilities to obtain an apartment in a shorter time period.

Who is to disburse the funds -- local Councils or enterprises? Both bodies are presently involved in this. There is a combined territorial - branch method of residential construction planning. It undoubtedly has shortcomings, but at the present state of affairs it is the only proper one. Of course, it would be considerably simpler to disburse all financial and material resources in accordance with the territorial principle, regardless of where people are employed. However, one must not lose sight of the fact that we carry out industrial planning by the branch principle. Under conditions of acceleration and shortage of labor resources, it would surely be premature to deprive ministries of this powerful instrument for promoting personnel satisfaction and social incentive. However, I am sure that sometime in the distant future we will adopt the territorial principle of residential construction planning.

Loggia Size, Better Trim Work and Social Justice

Questions pertaining to housing distribution are not in principle under the purview of the Gosplan. However, this should be discussed briefly, since miscalculations and infractions perpetrated in apartment distribution have the effect of prolonging the waiting period. Accordingly, any infraction committed in assigning housing, particularly the misuse of one's official position, to say nothing of bribery, should be considered as plundering of people's property and be subject to severe punishment.

It is also necessary to enforce democratic principles in apartment assignment. It would appear that even now no order can be issued without the approval of

the community, deputies' committees, or trade organizations, but, as shown by checks (and as discussed in many publications, including LITERATURNAYA GAZETA), the proper procedure is often violated. Enforcement of procedural policy (perhaps also by legislation) should be taken more seriously.

Also requiring refinement via acts of legislation in the area of housing distribution is the concept of the role of individual labor contribution. At the present time the major consideration is meterage. In this regard, a loafer and an excellent design engineer are treated equally relative to placement on the waiting list, which is unfair.

Finally, about payment for apartments.

Apartment rates applicable to state-financed buildings are regulated by a total of 76 acts of legislation. These include payment in general, benefits, entitlement to additional space, etc. However, there are only two major acts. One is the decree passed by the Central Executive Committee and the USSR Council of People's Commissars of 4 June 1926 relative to apartment rentals and measures for regulating house occupancy in urban areas, and the other is the Principles of Residential Legislation approved in 1981.

Since in 1926 the greater part of available housing consisted of buildings possessing few amenities and living quarters were assigned by the room, apartment rent payments were set on the basis of floor space, without consideration of utility rooms, kitchens, front rooms, bathrooms, loggias, balconies, etc.

This was understandable. There were virtually no loggias or balconies, and there were too many families using each kitchen to set up payments for kitchens.

At the same time, apartment rental payments were set up to assure viability of the residential housing economy. Payments were set at various rates, depending upon amenities and quality of housing, location in cities, even size of city and income of laborers and white collar workers. In this connection, apartment rental payments comprised an average of 10 per cent of the budget of the laborer's or white collar worker's family.

At that time the maximum apartment rental payment for laborers and white collar workers was set at 1 ruble 32 kopecks per month, which at the present rate is equivalent to 13.2 kopecks per square meter of living space. This maximum rate has remained unchanged to the present time in nearly all union republics.

There is also the decree of the TsIK SNK SSSR [Tsentralnyy ispolnitelnyy komitet Soveta Narodnykh Komissarov -- Central Executive Committee, Council of People's Commissars of the USSR] of 1928, which permitted an increase of 25 per cent in housing payments in buildings erected after 1924, i.e., a rate of 16.5 kopecks instead of 13.2. This additional amount is presently applied in certain cities. In high-rise buildings located in Moscow, the square meter rate is 30 kopecks.

There are also various apartment rental payments for military personnel, special

pensioners, invalids, families of servicemen lost in the war and a number of other categories of citizens. A particular group of apartment renters is entitled to additional space, for which they pay an added amount at prevailing apartment rates (that is, at the usual apartment rate).

The entire payment system obviously needs refinement and should be linked more closely to quality and size of space occupied, since living standards have changed substantially, especially in the last few years.

The average construction cost per square meter in only the last 25 years has risen by more than 65 per cent or almost 100 rubles. At the same time, the cost of maintaining an apartment has also undergone considerable increase. The method of determining rent based on the differential principle, whereby amenities, quality of housing and income of occupants are taken into account, is virtually no longer applicable.

There is in the country no standardized method for calculating rental amounts for additional living space, a situation causing inefficient use of available quarters, improper assignment of housing and subletting at speculative prices.

But that is not all. It has turned out that apartment quality has improved substantially, and outlay for the apartment has decreased, comprising less than the 3 per cent of family budget stipulated in 1926. The result is that income from apartment payments does not cover expenses incurred for repair and maintenance of residential housing as established back then. The subsidy for maintaining state-financed housing amounts to more than 6 billion rubles per year.

Another situation which gives rise to unfavorable criticism is the fact that a segment of the populace is housed in well-built apartments in government-owned buildings practically cost-free, i.e., making a token rental payment, while another segment of the same working populace participates in cooperative or privately-financed construction, carrying the entire burden (or a considerable part of it) of cost and maintenance. There is an increasing trend to look upon this as a definite deviation from principles of social justice.

Apartment rental payment policy unfortunately completely ignores quality, furnishings, trim work, amenities, and size of kitchen, front room and other utility rooms, which constitute a privilege for families occupying apartments where all this is incomparably greater and better than in other housing.

It is surely advantageous to establish housing quality standards and categorize living quarters to effect differentiation in rental payments. The first category would include a residence offering all the conveniences, improved trim work, elevator, garbage dispenser, etc. In general, everything should depend upon amenities, appliances and soundness of construction. It would also be necessary to take into account such items as loggia size and ceiling height.

Differentiation of quality in payments is also an enforcement of the social justice principle.

It is apparently also necessary to think about changing the payment for

additional space. Rates of payment for additional space vary with the republic. For example, in the RSFSR the payment is three times the basic amount; in the Ukraine, it is 1.5 times greater.

No one is thinking of evicting people from apartments, but economic leverage is required to elicit the interest of occupants (if family size has shrunk) in exchanging their large apartments for smaller ones. In this connection, the ispolkom must of course take on the responsibility of handling these exchanges while taking into account the wishes of the occupants.

In accordance with government instructions, recommendations for improving the system of housing assignment and payment are now being developed.

Next year LITERATURNAYA GAZETA intends to publish a detailed discussion of all problems mentioned in the article "A Separate Apartment for Every Family". Prominent specialists in the fields of housing construction, accounting, assignment and legislation will provide comments, which will include answers to questions submitted by readers.

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ENERGY COMPLEX ORGANIZATION

MANY PROBLEMS OF CASPIAN OIL DEVELOPMENT DISCUSSED

Alma-Ata QAZAQ ADEBIYETI in Kazakh 7 Nov 86 pp 10-11

[Article by Otepbergen Aqypbekov: "Great Riches of the Embi"]

[Text] With the 12th Five-Year Plan, the process of developing new Tengiz oil and gas has accelerated in Gur'yev Oblast. It is formulated in the Basic Directions for the Economic and Social Development of the USSR during the years 1986-1990 and in the period up to the year 2000 that: "We must accelerate industrial development of oil lying very deep in the Caspian Basin." How much urgent effort, requiring selfless labor, persistent energy, creativity and systematic planning, will be called for in the process of accelerating development of the new mineral resources! It is easy to talk about this but it will be a difficult and complicated process when we set about accomplishing our goals.

By 1990 the Oblast will be producing each year 10 million tons of oil, 2.7 billion cubic meters of gas, 1.3 million tons of carbohydrate mineral factrate and 770,000 tons of sulphur. The foundation for this has now been laid and we have begun to receive today the richness of the future. "When you have a major task, do not forget the small things," runs some wise words. Before a truly interconnected, linked oil complex can be put into operation a broad construction program must be carried out. How will these measures be carried out, what will be the future product of the production complex be like, will not economic gains harm the environment or the ecology as a whole? What kind of contribution will research organizations make to this great mining effort? The material below deals with such vital question of Tengiz oil development.

1. Economy and Ecology

It is true that economy and ecology are radically different ideas. However, I do not use "zhane" [and; isolating] to create distance between the two words but combine them with "men" [and, with] as a pair of concepts with little difference between them. We think of economy in terms of what we have achieved, as the measure of national well being, as a total

expression of our defense capacity, of our potential, of our progress and of our consciousness about work. The same qualities pertain to ecology. If we do not protect and increase natural riches and resources, if we do not use their benefits wisely, the scope of our future horizon will not widen nor will abundance increase. The environment, the riches of earth, air, water and forest etc., are our inexhaustible store for the future. But we must understand the word "inexhaustible" properly. We must also not forget that they are not inexhaustible riches.

During October of the current year an event took place in the history of the Tengiz reserves of particular importance. No 37 Well there began to ooze with "black gold" and began to produce oil. "Blood" began to run along the minarets raised to the heavens in the broad steppe and the veins of abundance began to throb. The new product of a new industry was introduced to life.

A new product--our new product--oil! And we have not just begun to extract oil alone. But other valuable riches are being wasted as gas and sulphur issue wastefully into the air. If you ask why, it is because a cracking plant and a cracking system have not been considered together with this beginning. Leading national equipment and technology to process this raw oil, containing large quantities of sulphur gases, has not yet taken shape. When it has taken shape, and when it has been put into productive use, gas and sulphur will no longer issue uselessly into the air. We cannot forget the damage caused to the economy and to the ecology by this practice.

Efficient use of natural resources is a basic economic and ecological principle. It fulfills an important role in preserving for biosphere. From a strictly economic point of view, with each passing year gas occupies [an increasingly] important role as a proportion of energy sources. Its consumption will reach 25 percent [of all energy consumed] by the year 2000. We today are harming the future of this valuable fuel and are completely wasting it. This waste is causing harm both to the environment and, strictly speaking, to the ecological geography. For example, it is well known to science that concentrations of air pollutants are several times above normal in large, industrial cities. Concentrations of sulphur, nitrogen and carbon oxides are 4-5 times greater than the norms in the air of such cities. But what will the norms be for an area in which gas and sulphur are emitted continuously into the air?

"Let us struggle for an economical economy," the slogan goes, but why are the ideas so mutually antagonistic? We must think very soon about establishing advanced equipment and technology to put the gas and sulphur to use. According to the theories of scientists, the gas and sulphur will be considered oil raw materials in the future. We should look for ways to produce protein from them and use them for other synthetic products. Making protein--is this not making food products? We must not just think about us today but about tomorrow, the future. As the riches of the Embi escape into the air, they must serve the good of many, the needs of society. As we increase industrial capacities in this way, we must consider and solve

problems of the effects of this upon nature. Nothing could be better than establishing a special organization or laboratory for chemical protection and corrosion in the oblast as these measures are carried out. Likewise, it will be extremely important to systematize research on the effects of the environment on the human organism.

We have mentioned above that we will need to carry out a large scale construction effort, above all, before we can put the Tengiz oil complex into operation. The recently established "Tengizneftegaz," "prikaspiyskburneft'," "prikaspiyskneftegazstroy" and "Kul'saryneft'stroy" Construction Trusts are utilizing 1.5-3 million rubles of financing each month. Qulsary will become a city of 100-150,000 inhabitants in the future. During just this year alone, some 200 million rubles of financing will be utilized at the Tengiz oil-gas site. It is proper to say openly that the primary thing is to push forward, going around problems laming construction efforts. There are other things to worry constructors.

--Construction--it begins with roads--said Duysenbay Sapanov, chief engineer of the "Kul'saryneft'stroy" Construction Trust. He must move the most up-to-date equipment on inadequate roads, resulting in late deliveries of needed construction materials. The roads create utter difficulty for vehicles transporting heavy equipment.

The road problem was made provision for in plans to put the Tengiz oil complex into use. Recently a paved Qaraton-Tengiz Road has been built. The motor road between Qulsary and Qaraton has been renovated. However, the road problem is creating economic and ecological problems at present. In recent years road connections between inhabited areas have been repaired. However, still unresolved is the problem of roads between survey sites. At present the most reliable form of transportation there is the helicopter. When we take the expense of using helicopters into consideration, the urgency of solving the road problem for development as a whole becomes clear.

When roads are built here and there in the middle of the steppe, they destroy the layers of soil and exposes the land to erosion. When we add the effects of wind erosion the ecological question lies fully before us once again.

No 11 and No 19 Construction trusts of the oblast are over-fulfilling plans. However, No 42 Road Construction Administration and likewise the oblast Roads Division have only utilized between 50 percent and 75 percent of complex funding. There is funding but little is being accomplished. Looking into the matter more deeply, these lagging collectives are harming the oblast economy and ecology. When we speak of the struggle for each square meter of soil, we must understand this to mean the laying down of even one meter of road above plans. When we raise economic indicators in general we must also remember to keep ecological problems under control. This is because protection of natural riches begins with guarding and increasing them.

The question of drinking water is one which must be looked into in an oblast which has a great river like the Ural, not to mention the small rivers, and major seas such as the Caspian. Whereas on the average each person requires 30 liters of water a day, the figure has already reached 20 liters in Embi Rayon. According to known fact, each person living in large cities uses 300-350 liters of water a day. How is the problem of supplying sons in the future, with fresh water to be solved.

According to plans, a water distribution and purification construction complex is planned for the Ural and likewise extension of a water pipeline from Astrakhan' to Mangghyshlaq. These measures are already being taken in hand. However, work on the Astrakhan'-Qulsary pipeline is not going forward energetically. Units of the USSR Oil-Gas Construction Ministry undertaking the million for the first 8 months of the present year. If resolute measures are not taken, there is the danger that this important project will be unable to benefit us in the coming year. However, even if the project is pushed forward resolutely, the water problem, which will require large scale water construction as noted above, will still not be solved totally. To achieve this we must think about the construction of the "Araltobe" Dam, which has been put off for many years.

Various proposals have been advanced now and in the past on the construction of the dam. The very first of them is the view that "there will be substantial evaporation of water due to the summer dryness and difficult climate of the oblast. This view was not at all incorrect, but was no reason not to build the dam. The reason that this would not prevent the building of the dam is that dams intended for an arid climate with little evaporation of water have been built in recent years in the southern oblasts of the republic and have shown a high level of return on investments. Why cannot we draw up plans for dams very well-thought-out scientifically with little evaporation. The "Araltobe" Dam should by all means become one of such highly efficient dams. This will be a future need of the rich Embi.

The position of the water distribution project to be built upon the Qighash River in supplying water is special. We must also realize the need for efficiently organized use of various other large and small sources of water besides these. One of them is the Zhem River. Since the waters of this river, which rises from the Mughadzhar Mountains of Aktyubinsk Oblast have been used by many enterprises of the two oblasts, its flow has abated in some years. When it does not overflow its banks, the river provides well for four sovkhoses of Embi Rayon. The waters of the river flow into "Lake Qamys Kol" at the rayon center of Qulsary through the "Qulsay Channel."

The foundation of the future city are being laid near Lake "Qamys Kol." The first microrayon is taking shape there. As we ourselves are building artificial lakes there, we must make resolute efforts to see to it that we do not drive away the free gift of nature. Because local inhabitants have become accustomed to throwing their waste and garbage into the "Qulsay

Channel," it would likewise be suitable to look for a "place to live" from this "Qamys Kol" Lake of garbage. However, the adding of construction wastes to this must be prohibited. In the process of his discussion with us, Yuriy Vasil'yevich Korneykin, the future chief architect of the city, made known that he was very worried about this.

Indeed, there are few things not to worry about. Let us look at some others.

2. Why Does Science Look Askance

How much the leading examples, high level results and major achievements of the present in our lives today are considered achievements of science and technology is only natural. As time goes on, the connection between science and production has from the [example of the] Tengiz oil and gas fields as witness of this. We are not wrong, moreover, when we say that even the existence of the oil reserves was known in advance, to this "frying pan" science. We find one evidence of this in the "qazaq Sovet Entsiklopediyasy" (Kazakh Soviet Encyclopedia) which appeared in 1976 (Vol. 8, pp 208-09). It draws the following conclusion:

Possibilities for finding oil in Kazakhstan and or opening large reserves of it are connected with the paleozoic layers beyond the salt layers of the Caspian Basin (sinekpiza [?]), considered one of the very largest traps of the earth's surface.

It is clear that this theory was expressed long before 1976. It appears that the theory is not far from today's truth. In fact, the Tengiz reserves are located very deeply, belong the salt layers.

The Tengiz reserves, in addition to making possible an oil and gas industry, will make possible the development of petrochemicals as well. This is because there are gas concentrates and large amounts of sulphur besides the oil and gas in the raw oil that is produced itself. It is a difficult thing to record that scientific organizations have done little to turn these riches into a benefit to the nation without waste. "Without science there are no results," is a statement heard often. Let us now consider the question of what contribution research and planning organizations have made to the development of Tengiz resources.

The role of research and planning organizations in the development of the Caspian region oil and gas complex is a weighty one. Be that as it may, the scientific base in the oblast, the KaSSR Academy of Sciences Petrochemistry and Natural Salts Institute profitability of scientific research carried out by the institute is weak in terms of practical benefits. Suggestions put into practice are of a general nature and show little return. Such general statements, rough science, are impotent in raising production profits.

There was particular discussion on the work of this Institute at a meeting of party and economy activists held in September of this year. In truth, "the Petrochemistry and Natural Salts Institute of the KaSSR Academy of Sciences has been unable to show activism in solving key problems in the

survey, production and transport of oil and gas." The Institute has been carrying out research on four themes considered important for the "Embanefit" and "Gur'yevneftegazgeologiya" Unions. However, for two years and these themes have not gone beyond the level of laboratory research. The refinement of the research scientifically and the addition of new ideas to it has been put off too late. With this strange image in mind, the question of "why we continue putting to work research organizations of no help to the great complex?" obviously occurs to us. Yes, why do we go on putting them to work.

The Institute places its emphasis on unplanned research distant from its research themes and directions. Such research is encouraged and has become cause for boasting. Petrochemistry scientists, broadening the scope of "learnedness" and "professional excellence," have begun to produce microphones, ichthyological equipment and other industrial goods. In a word, they have not been sitting on their hands. The oil workers, however, who have been waiting eagerly for their help, with the boast "as a thinker thinks, we have done fool's work," are dripping with sweat using the same old methods as they sink their drills in deeply. In place of such well established close unity of a lazy science and production they rely on hard work.

It is advisable to get beyond all the noise that is being made. What is needed in such circumstances is nothing but well-founded effort. The present Institute leadership must develop research work resolutely in the area of mastering geological deposits and increasing the return of oil from the layers. If we come out against the apathy of today is this not to enhance the power of national goodness in the future?

As this time we think that the work of the All-union Complex Institute for Fuel-Energy Questions specially organized by the USSR State Planning Committee in Moscow must be carried out appropriately based upon effort of the Caspian oil and gas complex showing a return. To achieve this, nothing would be better than creating a unified system of unions of geological-surveyors concerned with oil production. Centralization in one place and administration in one place would be the beginning of proper, model and good quality work. In general, a common control system to unify and prioritize geological survey and oil products sector production interconnections of scientific research and planning organizations is needed. In this way science would not be something askance from production and production would not complain about science. Thus, in a great complex, science should not remain on the sidelines.

The life of the Tengiz complex will continue to develop and is the sound of the 21st century. "Blood" is running through the minarets pointing skywards in the depths of the steppe, the "veins" of abundance are throbbing. It is as if heat, radiance and light are spreading from these minarets. Minarets... minarets:

Minarets--setting fire to the world,
Minarets--the joy of a region;
Let the fires of the minarets not be extinguished.
The scientists have produced them in a flash.

Thus the poet Tolegen Aybergenov sang.

There are scientists, there are [workers of] research organizations and oil workers who have wiped the sweat from their brows. The light of the minarets will not be extinguished. The riches of the Embi will become part of national prosperity.

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ENERGY COMPLEX ORGANIZATION

EDITORIAL REVIEWS KAZAKH ENERGY

Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh 19 Nov 86, p 1

[Editorial: "Sources of Fuel and Energy"]

[Text] Kazakhstan--Fuel and Energy Sources. Thus the role of Kazakhstan in carrying out the Soviet energy program is extremely great. The oil and gas, coal, electrical and nuclear power from the recesses of the earth of Kazakhstan are a reliable base for the energetic development of the people's economy. First priority was assigned in the resolutions of the 27th CPSU Congress and 16th Congress of the Kazakhstan CP to further development of the fuel-energy base in Kazakhstan in terms of the disposition of production forces and the development of the economies of neighboring republics. The vast majority of major projects included in the Basic Directions for the Development of the USSR Economy and Culture during the years 1986-1990 and in the period up until the year 2000 for our republic are in the fuel-energy sector.

Above all, it will be necessary to guarantee the flourishing of the Pavlodar-Ekibastuz and Mangghyshlaq Fuel-Energy Complexes. To achieve this it is indicated that coal production will have to reach planned levels at Ekibastuz, various coal deposits in central Kazakhstan will have to be put into exploitation, oil and gas reserves of the Caspian area will have to be made to serve the people's economy rapidly and powerful electrical stations and lines will have to be built.

Production of electrical energy in Kazakhstan will reach 102.7 billion kw hours towards the end of the Five-Year Plan, up 26.3 percent over 1985. It is planned during the 12th Five-Year Plan that the 5th Energy Bloc of Ekibastuz State Rayon Electrical Station [No 2] will be put into operation and construction of the Ekibastuz State Rayon Electrical Station No 3 will begin and construction of the first section of the Shul'ba Hydro-electrical Station on the Ertis will be completed. Likewise, thermo-electrical centers in Alma-Ata, Karaganda, Tselinograd, Oskemen and some other cities will be expanded or rebuilt. The stringing of the Ekibastuz-Aghadry-Souther Kazakhstan State Rayon Electrical Station electrical transmission line will continue.

Proper operation of energy industries is of particular importance for the entire people's economy. During the 11th Five-Year Plan, some 93 billion kw hours less of electrical energy were produced due to the breakdown of equipment from time to time. This deficiency resulted in reduced production of certain products by industries, limiting consumers. This problem has repeated itself again this year and plans for production of electrical energy were not fulfilled during the last three quarters. It is necessary for the republic Ministry of Energy and Electrification to make better use of existing resources to achieve their reliable operation without breakdown, to achieve strict control over work of all components in electrical stations and to provide absolutely needed quantities of coal, oil products and raw materials while strengthening conservation and economy.

Production of oil and gas occupies a special position within the fuel-energetics industry. During five years republic oil production will increase 44 percent, gas three-fold and production of gas concentrate six-fold. To achieve such levels it will be necessary to develop the Mangghyshlaq Territorial-Production Complex further and bring to life the new rayon of the Caspian region. Broadening of the scope of exploitation and of utilization of Bozashychy Peninsula reserves and of perspective resources of Zhangazhol and utilization of resources at Tengiz, Qumkol and other places are key tasks of the Five-Year Plan. Growth of gas production will be guaranteed based upon utilization of gas concentrate resources at Qarashyghanaq in Uralsk Oblast. This is a party task of importance for the people's economy assigned to party and Soviet organizations in Mangghyshlaq, Aktyubinsk, Gur'yev and Uralsk Oblasts.

During the past three quarters, plans for oil production, primary oil refinement and gas production have been over-fulfilled. The present task is to see no abatement of the rate of growth during the difficult autumn-winter season. Production of 115,000 tons of oil and condensate and 90 million cu m of gas above plan amounts by workers of the republic oil and gas industry according to socialist obligations taken up for this year will mark the first major watershed achieved in carrying out the resolutions of the 27th CPSU and 16th Kazakhstan CP Congresses. Primary refinement of oil must grow by 26.4 percent. However, primary refinement of oil will grow by some 30 percent within the Five-Year Plan through utilization of the capacities of the Chimkent oil processing plant and achieving the full capacity operations of the Pavlodar Oil Processing Plant.

Urgent tasks lie before the republic in the coal production sector. Coal production will increase considerably towards the end of the Five-Year Plan. Nearly 75 percent of all coal produced will be excavated with efficient open pit methods. The Ekibastuz "West" coal pits will attain full capacity this Five-Year Plan. Reconstruction and technological re-equipment of the Karaganda Basin mines must be carried out at a rapid pace. Putting the "Priozernyy" Pits into use at the Shubarkol Mines and in the Torghay Coal Basis and utilization of the Maykobe Basin are sources for increasing coal production. This year's goal of republic coal miners--producing 850,000 tons of coal above plan--will help.

Following and spreading the example of the Karaganda M.T. Kalinin imeni Mines Collective, which has launched the initiative of increasing labor productivity 2 percent above plan, in the front ranks of leading industries, will promote socialist competition as a special reserve of mass creativity.

One problem which must be kept under the particular surveillance of republic party and Soviet organizations is the construction projects of the fuel-energy complex. Whereas rapid construction of the Ekibastuz State Rayon Electrical Station [No 2], the Tengiz oil and Qarashyghanaq gas concentrate projects is indicated in the socialist obligations of the republic taken up for this year, the present pace of the work is inadequate.

Considerable delays have been allowed in construction-installation work at energy projects. The "Ekibastuzenergostroy" Trust has utilized 26 percent of funding during the first three quarters at the Second Ekibastuz State Rayon Electrical Station. The first energy bloc is due to be put into operation next year. The primary cause of the unsatisfactory work is shortage of labor cadres and failure to create proper living conditions for them. Plans for housing construction have not even been half fulfilled. The work situation in construction of the 4th section of the Ekibastuz Thermo-Electrical Station and the Shul'ba Hydro-electrical Station in Semipalatinsk Oblast is unsatisfactory. This requires effective measures from party and Soviet organs in Pavlodar and Semipalatinsk Oblasts.

There are also many deficiencies in the development of the oil-gas complex in the Caspian region. The KaSSR Ministry of Construction and Motor Roads and the "Glavkazneftegazstroy" Chief Administration must speed up creation of a production base and the construction of social projects in the Tengiz fields.

The militancy of republic communists and workers is need to develop the fuel and energy complex and increase its productivity. We must absolutely fulfill this task.

/12624

CSO: 1822/053

ENERGY COMPLEX ORGANIZATION

EDITORIAL WARNS ON ENERGY PROJECT LABS

[Editorial Report] Alma-Ata SOTSIALISTIK QAZAQSTAN in Kazakh on 29 October carries on page 1 an 800-word boldface editorial entitled "On-Going Construction Projects." The Editorial issues an end-of-the year warning to construction projects which are not advancing quickly enough. A number of energy projects, including the Ekibastuz No 2 State Rayon Electrical Station, the 4th Section of the Ekibastuz Thermo-Electrical Station and the Shul'ba State Electrical Station are singled out for criticism.

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CSO: 1822/053

LABOR

DIFFERING VIEWS ON EVENING LATE-SHIFT SYSTEM

Worker, Officials' Comments

Moscow TRUD in Russian 10 Sep 86 p 2

[Statements obtained by TRUD Correspondent V. Konstantinov at the Uralkhimmash Production Association: "Three Opinions of the Night Shift"]

[Text] The transition to working two or three shifts requires careful preparation with appropriate economic and organizational measures. What kind of problems must be resolved in introducing a night shift? TRUD correspondent A. Konstantinov addressed this question to a worker, a trade union committee chairman, and a director of an enterprise.

Statement by A. Sovpenets, turret lathe operator in Workshop No 38 at the Uralkhimmash Production Association:

I've been at the association 25 years. Some of our machine-tool operators work three shifts. But this is what hurts. Sometimes, they find themselves in a worse position than those on a one-shift or two-shift schedule.

Our norms are strictly set. The slightest tie-up threatens the shift quota. Yet it's the third--the night shift--when most of the time is uselessly lost. For instance, there is not even one mechanic on duty at night. Not long ago a nut jammed on the carriage of my lathe at the beginning of the third shift. There was nobody to repair it, and the lathe stood idle the entire shift.

It's the same problem with shavings. Up to three tons of shavings are "produced" by a lathe in a single shift. There's a veritable snowdrift underfoot. And who's to clean up? We have few assistants and nobody at all to clean up. So practically every hour the lathe gets turned off to clean up the work area and load shavings onto carts. You won't believe it, but up to 40 percent of the work time is spent on this. It hurts to lose it during the day-time, but at night it hurts even more.

And at the end of the shift we'd get home a little faster if we could, but no, it takes 30 minutes more or else the lathe operator loses as much as an hour in turning over the night's parts to the OTK [technical control section]. But

OTK workers, like the mechanics, don't work the third shift. And in the morning there is a line at the control section. Of course, my replacement could turn in the parts produced, but I want to do it myself.

One more question. At the enterprise we have our own excellent rest and recreation facility. Every Friday at the end of the first shift buses take the people there and they have two marvelous days of rest. They sit in the sun, they pick mushrooms. It's very convenient for everybody, except for those who work in three shifts. Judge for yourself. By law, as you know, each one is supposed to work 41 hours in the course of a week. The night shift lasts 7 hours. This means in the course of a week of working at night we still have 6 hours to go. We finish up on Saturdays--that's in the very week when we're working the first shift. And that's why we don't get to the rest area. Take me, for instance. Twenty-five years at the association and I've been there exactly once. That day our brigade was going on television and they brought us all there specially--to show in what a wholesome way we get our rest and relaxation.

Statement by A. Borisov, chairman of the association Trade Union Committee:

The association collective has accepted intense obligations under the 12th Five-Year Plan: to raise the volume of production and labor productivity by a factor of 1.5 by the end of the plan. For the most part this will be achieved through reconstruction of production, improving the utilization of equipment. The task cannot be carried out if a significant part of the machine-tool operator workforce isn't converted to a two- and three-shift system.

How do we solve this problem? At one time we made the proposal to some workers in the stock and assembly shops--welders and boilermakers--to undergo retraining as machine-tool operators. But they wouldn't agree to it. In fact, the reverse process is to be seen: lathe and milling machine operators off to the stock and assembly shops because there they have no third shift. That is why the administration and the association trade union committee is now working out ways to improve labor conditions for the machine-tool operators, together with a more efficient organization of the workload during a night shift. Since the start of the year, for example, free meals have been arranged for workers on the night shift. Machine-tool operators have priority access to dormitories and institutions for children. The problem of improving evening-hour city transport has been resolved by the enterprise management in association with the tram and trolley-line administration. And we are now planning to provide the machine-tool operators with work shoes, free of charge, out of enterprise funds.

But undoubtedly we could do even more. As it happens, we still are not learning enough about the workers' needs. I only just learned, for example, from the story of Adam Yakovlevich Sovpenets that it's difficult for brigade members to get out to the rest facility. We will, of course, get this matter resolved by arranging a supplementary bus run at a time that is convenient for the machine-tool operators.

But not everything is within our power. I think that the problem of the machine-tool operators--that is, the problem of raising the effective utilization of machine-tool work force--must be come to terms with in the context of the country as a whole. Why is it, let's say, that many workers get special clothing, while a lathe operator can't even claim a pair of gloves? Machine-tool operators get less leave-time than do a lot of other specialities.

The workers pose this question as well. It is essential to make the 7-hour night shift commensurate with the 8-hour day shift so that machine-tool operators don't need to finish up their work on their days off. I am convinced that solving these problems would help raise the prestige of machine operations and alleviate the urgent problem today of organizing night shifts.

Statement by V. Sannikov, general director of the association:

All high-productivity, special-purpose equipment is to be used in three shifts. This is a task we intend to carry out in the course of the 12th Five-Year Plan. Presently, the shift index of such equipment is 2.07. This, of course, is insufficient. We intend to address this task in a number of ways. Raising the prestige and improving the working conditions of machine-tool operators will help to curtail the instability of labor conditions, especially in the night shift, and attract youth to the machine shops. We will try to convert a part of the OTK working staff to the three-shift schedule. Arranging for the repair of equipment in the third shift is more difficult. Mechanics are the most "unstable" category of workers in the association. The way out, as we see it, is in the creation of an on-duty repair service: machine repairs to be carried out on call for correspondingly higher pay.

Multi-machine maintenance will also help to offset the shortage of work hands in the machine shops. We have workers who can look after several machines simultaneously, but there ought to be more. In our view the growth of their ranks is hindered by the fact that the new equipment coming out simply does not lend itself to multi-machine maintenance. The production of the various machine-tool plants differs so often in operation that workers who have learned to attend to one type of machine cannot take care of another. It is time to standardize the electrical circuits of machines, especially with numerical control.

Newspaper's Response

Moscow TRUD in Russian 10 Sep 86 p 2

[Commentary by TRUD correspondent V. Konstantinov: "Three Opinions of the Night Shift"]

The three views of the problem significantly attest to similarities as well as differences in how it is looked upon by the worker, the trade union official and the director. The people work the night shift unwillingly because the organization of labor leaves much to be desired, host of problems regarding productive daily activity and leisure are not thoroughly considered. Who should be concerned with all this? The trade union committee and the administration, of course. Yet it was only at the time of the interview that the

union chairman, A. Borisov, found out that the brigade of machine-tool operators cannot get to the recreation facility. Strange, isn't it? And the problems of repair and turning in finished products during the night shift did they really arise only yesterday? Are these problems so difficult that this much time is required to resolve them? Both the administration and the association trade union can and should address the problems of the night shift more vigorously.

The same holds true for many other enterprises. It was not so easy, as it turned out, to find a machine-building enterprise in Sverdlovsk where the people wanted to work a night shift. At most of them the machines stand idle from midnight to morning and the lights in the workshops are out. By way of explanation the enterprise managers most often refer to a workforce shortage, primarily of machine-tool operators. Meanwhile, a major part of the workers are attending to obsolete machinery. At this same Uralkhimmash about a third of the machine-tool operators are veterans with 20 years or more on the machines. A comparable situation exists at many of the enterprises. To discard outdated equipment and, with the help the machine operators released, to organize a three-shift schedule using up-to-date technology, this is, in essence, the initiative of the Leningrad machine-tool operators. However, at Uralkhimmash and a number of other enterprises, it seemed to me, that for the time being they talk about increasing the numerical strength of the machine-tool operators more enthusiastically than they do about replacing outdated equipment. Such an approach implies an inclination to deal with new tasks in old ways--a psychological inertia. It is this inertia, apparently, together with other casual factors, that presently hampers efforts to maintain modern equipment at all the enterprises more efficiently. Yet reorganization is everyone's job. Not long ago the party obkom in Sverdlovsk examined a program for converting the enterprises of the oblast to a two-and-three shift schedule. In Sverdlovsk alone 20,000 pieces of obsolete equipment were slated to be taken out of operation, thereby markedly raising the shift index of lathes and other machinery. The tasks confronting enterprise collectives are formidable, and their achievement requires coming to terms first of all with the parade of problems to which A. Sovpenets referred in his interview.

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CSO: 1828/18

LABOR

PROVISIONS FOR WORKER TRAINING, APPLIANCE SERVICING SOUGHT

PM220943 Moscow IZVESTIYA in Russian 15 Dec 86 Morning Edition p 2

[TASS "Official Section"]

[Text] For the Assimilation of New Equipment

The CPSU Central Committee and the USSR Council of Ministers have adopted a resolution "On Improving the Practice of Training and Retraining Cadres for the Assimilation of New Equipment and Technology in Sectors of the National Economy."

The resolution notes that the present system for the further training and retraining of workers is insufficiently geared to ensuring the timely provision of cadres for the assimilation of advanced equipment and technology in newly built, reconstructed, and planned enterprises. This results in lengthy delays before many new enterprises reach their design capacity.

USSR ministries and departments and union republic councils of ministers have been instructed to elaborate and implement measures to provide specialist and worker cadres for the latest avenues in the development of equipment and technology in the national economy's sectors and to substantially raise the personal responsibility of leaders of ministries and departments, associations, enterprises, organizations, kolkhozes, and sovkhozes in this work. It must become the absolute rule that the training of cadres in the use of the latest equipment and advanced technology should precede their introduction and be given priority over the reconstruction and refitting of existing production units.

It has been deemed advisable for the further training and retraining of cadres in the operation and servicing of new equipment, machinery, and advanced technology and the introduction of newly developed models of machines, units, and other machinery and of new agricultural crop varieties to be organized, as a rule, at study centers and test sites of front-ranking enterprises and in vocational and technical schools for workers, and at the relevant further training institutes, VUZ's, technical colleges, and training test sites for specialists. Measures have been planned to substantially improve planning of the training, further training, and retraining of cadres in the sphere of new equipment and technology.

The practice of establishing intersectorial institutes for the further training of cadres in new avenues of the development of equipment and technology under the country's leading VUZ's will be expanded with a view to eliminating lack of departmental coordination in organizing work on the further training of leading workers and specialists. These institutes will be responsible for generalizing experience of cadre training and retraining and for coordinating teaching-method work and publishing the relevant teaching-method literature for all components of the system for the training, retraining, and further training of cadres. Measures have been planned to significantly improve the lecturing staff at institutes and faculties for further training. Leading specialists in the national economy, scientists, and highly skilled workers from VUZ's and from scientific research and planning and design organizations will be recruited for tuition work in them on an increasingly broad basis.

A number of study course combines and secondary vocational and technical schools possessing a modern material and technical base and highly skilled specialists are to be transformed into permanent sectorial and intersectorial regional study centers for the training, retraining, and further training of workers in the operation and servicing of new models of equipment, machines, and units.

Other measures have also been planned to improve the provision of cadres for the assimilation of new equipment and technologies.

On the After-Sales Servicing of Complex Household Appliances Owned by the Population

The USSR Council of Ministers has adopted a resolution "On the Organization of After-Sales Technical Servicing of Complex Household Appliances."

In order to improve the organization of technical servicing and repairs to complex household appliances and to widely involve the ministries producing household appliances and instruments in this work, the USSR Council of Ministers has ordered:

The USSR Ministry of Machine Building for Light and Food Industry and Household Appliances to carry out after-sales technical servicing and repairs of refrigerators and freezers and of washing, sewing, and knitting machines;

The USSR Ministry of the Automotive Industry to do likewise for motorcycles, motor scooters, and bicycles;

The USSR Ministry of the Electrical Equipment Industry to do likewise for electric vacuum cleaners, air conditioners, and other complex electrical household appliances.

For this purpose the ministries in question must create in 1987-1990 technical sales and service centers for the after-sales servicing and repair of complex domestic appliances in a number of the country's major cities, and must follow this up in the 13th 5-Year Plan by organizing a network for after-sales servicing of this type of equipment in other parts of the country.

At the same time, the technical sales and service centers will also carry out pre-sales inspections of complex household appliances and will set up a replacement stock of such appliances to be made available to citizens while their own appliances are undergoing repairs.

The USSR Ministry of Justice, the USSR Ministry of Trade, and the USSR State Committee for Standards have been instructed to elaborate, with the participation of interested organizations, and to approve within a three month period new rules for the replacement of complex household appliances breaking down while still under guarantee, bearing in mind that these rules must be substantially simpler than the current ones and must meet the purchasers' demands as far as possible.

It has also been laid down that the creation of the aforementioned centers for after-sales technical servicing and repair of complex household appliances does not relieve enterprises under union republic Ministries of Consumer Services of responsibility for performing technical servicing and repairs of such appliances.

To Rationally Utilize Material Resources

The USSR Council of Ministers has adopted a resolution "On Measures To Reduce Stocks of Commodity and Material Assets in the National Economy" to further strengthen financial autonomy, expand the normative method of planning the activity of associations, enterprises, and organizations, and boost their interest in and enhance their economic responsibility for the rational utilization of material resources.

The USSR Government has deemed it necessary to switch to the normative method of planning material stocks as from 1987. The USSR Gosplan, jointly with the USSR Ministry of Finance, the USSR Gosbank, and the USSR Srobybank, has been instructed to set stable normatives for 1987-1990 for the maximum level of stocks of commodity and material assets per R1 of volume of sales of output, work, or services (according to type of activity) for USSR ministries and departments and union republic councils of ministers. The normatives in question must be progressive and must be aimed at sharply reducing stocks of material assets.

USSR ministries and departments and union republic councils of ministers must, within a two month period, establish differentiated normatives for the maximum level of material asset stocks in associations, enterprises, and organizations under their jurisdiction on the basis of the specific nature of their production activity, and must report these normatives to each association's, enterprise's, or organization's local USSR Gosplan or banking institution organs.

It has been decided that, starting in 1987, any association, enterprise, or organization exceeding the set normatives for the maximum level of commodity and material asset stocks will contribute to the state budget revenue out of any profits remaining at its disposal an additional payment equal to 3 percent of the value of the excess stocks of these assets.

As of 1987, associations, enterprises, and organizations will be allowed, without coordination with ministries and departments or USSR Gosnab organs, to sell any unutilized commodity and material assets to state or cooperative associations, enterprises, organizations, or institutions, or to the population. The USSR Gosnab has been instructed to ensure the further development of the system of brokerage services by setting up in 1987 commission-sale stores and other financially autonomous enterprises for the sale of unutilized raw and other materials, articles, equipment, and other material assets, including second-hand ones.

/12913

CSO: 1828/47

INTERSECTOR NETWORK DEVELOPMENT

ADVANTAGES OF INTERSECTOR TRANSPORT COMPLEXES, COOPERATION

Moscow MATERIALNO-TEKHNICHESKOYE SNABZHENIYE in Russian No 9, Sep 86 pp 32-37

[Article by M. Kaganskiy, member of the All-Union Council of Scientific Technical Societies' Transport Committee: "Transport Complex: Persistently Solve Intersector Problems"]

[Text] The party regards the reorganization of the economic mechanism as one of the main avenues for social and economic acceleration. The political report of the CPSU Central Committee to the 27th party congress posed the task of attaching modern organizational structures to management considering the concentration, specialization and cooperation of production. We are talking about establishing complexes of interconnected branches, scientific and technical intersector centers, various forms of economic associations, and territorial production formations.

During recent years, transport -- especially rail -- has been working under a great strain and is not coping with the shipping volume which the national economy is imposing.

In this connection, the idea of establishing a union-wide center for managing the transport complex is acquiring greater and greater urgency. Such a center would concentrate the planning and management of all shipments in the country in its hands. It would not simply outline final results, but it would also determine the resources for their achievement and the key influence factors and control the production activity of all transport systems.

Enormous capital investments are now being directed toward the development of all types of transport. The branches are being filled with ever more powerful and high-speed equipment -- locomotives, ships and motor vehicles. Movement speeds are growing. Each type of shipping resource -- taken separately -- is economically interested in compressing time and in delivering freight to destination points more rapidly. However, there is a paradox: It is getting to the consumer ever more slowly.

Nevertheless, there is no paradox there. The trouble is that the transport process, which is unified in its nature, has turned out to be fragmented

between numerous departments. There are more than three dozen transport ministries alone, including the republic ones. One cannot calculate the transport subunits of the other ministries and departments. Each one operates according to its own regulations and rules and is preoccupied with fulfilling its own indicators. They not only do not coincide but they also contradict each other.

Whereas the main indicators of railroad worker operators (tons and ton-kilometers) force them to deliver goods as rapidly as possible, the indicators of the warehouse workers (ton-operations) pushes them toward the repeated shifting of freight in storehouses. In turn, the work indicators of motorists (those same tons) force them to deliver not urgent products, but heavier ones, to the consumers so as to fulfill their own plan.

Unquestionably, the partners are looking for an opportunity for cooperation. It is no accident that an attempt to coordinate the efforts of all participants in the transport process and to direct them into a single channel, has arisen. There have been certain successes. Many transport hubs have been able to achieve clear-cut operations based on an interconnected and continuous plan-schedule. Even this very simple coordination form has provided a large economic effect. The movement of freight in transport hubs has been accelerated, and the use of rail cars, ships and motor vehicles has been improved. We managed to free more than 150,000 rail cars by this during the last five-year plan.

It seemed that an effective management method had been found. However, the plan-schedule is only an agreed work program; it does not provide any guarantees that a ship or rail car will be unloaded in a timely fashion. Essentially, the "great dispatcher" -- the hub's coordinating council, which includes the directors of the transport subunits -- arranges the operations. In the final analysis, the observance of the schedule depends exclusively on the good will of the council's members to fulfill their mutual obligations.

The perpetrator of the ineffective use of a partner's rolling stock bears no appreciable material responsibility. It is not provided for by the existing norm acts. One cannot consider the fines, which are collected for non-fulfillment of contracts and which are small in comparison with the losses inflicted, to be an effective measure.

All attempts to find a single interdepartmental solution and to establish common indicators and responsibility for the non-observance of assumed obligations have ended with zero results. True, the directors of four ministries -- the Ministry of Railways, the Ministry of the Maritime Fleet, the RSFSR Ministry of the River Fleet, and the RSFSR Ministry of Motor Transport -- have approved a joint Statute on a Transport Hub that contains these norms. The document, however, does not have any legal force and is not reinforced with an economic mechanism. That is why the work of the coordinating councils is structured, as before, on "gentlemanly" principles and not on a strictly regulated legal and economic basis.

The absence of effective management levers has become a serious obstacle on the path of cooperation. That is why attempts are now being made to fill the

legal vacuum and establish common indicators and a common material interest within a hub. Such experiments are being conducted in Leningrad, Ilichevsk and other large freight centers.

The future will show what this will provide. Let us assume that we will manage to reconcile the departmental contradictions and accelerate transshipments. However, a transport hub is only a cross-roads on the way to the consumer. The conveyor line must operate non-stop over the entire path that freight travels. For this, it is necessary that specialized rolling stock, transshipping systems, weighing facilities, and measuring equipment be readied at every junction; and that a single method for receiving and handing over freight be in effect. The failure to observe these requirements even in one transshipping place will have an effect on the entire rhythm of the shipping conveyor line.

In a word, an optimum schema for cooperation between transport hubs in the economic regions is required. The activity of these regional systems, however, is in need of cooperation -- at a higher, interbranch level. Today, specialists have arrived at a single opinion: A general transport management center, which is required to coordinate all transport operations on a country-wide scale, must solve all questions. N. Konarev, minister of railways, stated this right out from the podium of the 27th CPSU Congress. The USSR Gosplan also holds this point of view.

The specialists think that the center's structure should flow from its inter-departmental functions that are connected with the solving of general transport, economic, legal, technical, technological, commercial, and other questions; the distribution of shipping volumes between types of transport; and with the coordination of their work.

Naturally, the establishment of a single management body should lead to a reduction in the management staff in the branches -- you see, the general questions, in which dozens of specialists in each department were engaged, will be within the competency of the center. Shipping operations will remain under the direct management of the bodies controlling the various types of transport that have been reorganized with a consideration for the new requirements.

For example, Academician A. Voronov thinks that it is necessary to establish union republic ministries of the river fleet and motor transport, including in the latter the republic ministries of highways. It is also advisable to organize all-union bodies for managing container shipments and industrial transport, having allotted freight forwarding functions to them also. This will remove the barriers at the junctions of the departments and will permit an integrated transport service to be organized and goods to be delivered to the consumers.

They can object: Today, there already exists inter-branch coordination of container shipments -- specialized subunits have been established in the Ministry of the Maritime Fleet, Ministry of Railways, Ministry of Foreign Trade, the RSFSR Ministry of the River Fleet, and the USSR Gosplan.

It would seem that with such an impressive management system, container shipments should serve as a model -- a standard of clear cooperation between the branches. However, the "from door to door" container shipment system, which has proven itself positively throughout the world, is clearly slipping at the departmental junctions. Whereas 10 years ago failures in the development of the expected "container revolution" -- which did not happen -- were explained by citing the poor material technical base -- the absence of a sufficient pool of shipping and transshipping equipment, it has now become clear that the further building up of capacities without a radical change in the management system will not only not improve but also will worsen the existing situation to a great extent.

As is known, containerization increases the productivity of loading and unloading operations, increases the through-put capacity of transport systems, and permits the work to take place according to the most economic direct shipment version: shipside-rail car. Speed, cheapness -- it seems that these are the main advantages of containerization. They are completely destroyed, however, by the incomplete and ponderous system for compiling documents. For example, large-tonnage containers stand idle for weeks in the port of Leningrad while the All-Union Soyuzvneshttrans [Foreign Transport] Association prepares all the necessary papers.

The port workers have attempted to reduce document turnover time and have established an interdepartmental service. The document flow was speeded up sharply and an opportunity to establish an "ASU [Automated Control System]-container" for collective use appeared. However, Soyuzvneshttrans-- guided by narrow departmental interests -- eliminated the required service. Now the Leningrad office of Soyuzvneshttrans, the port and the Baltic Shipping Company are forced again to compile each document over and over again.

An example graphically reflects the state of affairs with respect to the development of transport ASU. They are designed as closed systems, without an interface with the interbranch and, moreover, the state level. It is impossible to connect them in a common network; they "speak" in different languages. Even the USSR gosplan is developing its own automated system for planning estimates separately from departmental ASU. What kind of common control system can one talk about!

Only a transport-wide body, which has taken upon itself the solving of interbranch questions, can eliminate this departmental internecine dissension. Of course, some directors of transport ministries, especially the republic ones, will oppose the amalgamation and centralization of control -- you see, they will have to part with a certain amount of independence and also do without income from freight forwarding duties and other operations. This question, however, can be solved by developing an original labor participation coefficient, having redistributed incomes with a consideration for the contribution of each branch.

The establishment of a transport-wide body is a command of the times. Its organization integrally flows from the envisaged basic directions for the

economic and social development of the following tasks: to establish bodies for controlling groups in interrelated branches and to improve the work coordination of all types of transport. A well thought out and rational structure and an accurate distribution of the work, which insures the actions of the links in this technological system as a single whole, are required so that this body will function effectively and not be transformed into another superstructure which duplicates the specialized branches.

As yet, there is no clarity like this. When they talk about a transport complex, they usually have in mind mainline transport. They forget a very important connecting link between main lines and the consumer -- industrial transport. Not everyone even thinks that this is in favor of the economy. It consists of approximately 150,000 kilometers of railroad sidings -- equal to the number of mainline lines in the Ministry of Railways network, hundreds of river berths, many hundreds of thousands of square meters of forklift areas, and tens of thousands of items of loading equipment. The main task of industrial transport is the timely transport of increasing freight, the supply of rolling stock to the loading and unloading fronts, the loading of finished products, and the unloading of products arriving at the enterprises. In a word, that which in ordinary life is called service.

The following information testifies to the scope of its activity. More than 180,000 rail cars are loaded and more than 160,000 are unloaded annually on sidings. All types of industrial transport, including motor vehicle and other types, transport approximately 35 billion tons of freight a year. The shipping volume will come close to 40 billion tons by the year 2000. Such an enormous supply has essentially been on the side of the transport conveyor line.

Let us take the industrial railroad network. There are quite a few structural irritations here. Several transport organizations, which service their own enterprises, "sit" at one and the same mainline station and, at times, at one and the same spur. One does not have far to go for examples. The spurs of Borets, Stankolit and another four enterprises, each of which has its own facilities, adjoin the Moskva-Butyrskaya Station. The spurs of another series of plants, which are serviced by the interbranch organization of industrial rail transport, adjoin the neighboring station of Beskudnikovo. The logic of sensible management suggests that the transfer of all loading and unloading equipment to one firm would permit the number of technicians, workers and management personnel to be considerably reduced and labor productivity and the quality and effectiveness of work to be increased. Departmental disconnections, however, are preventing this.

The same situation has taken shape in many of the country's regions. If one speaks theoretically, the organizations of two industrial transport systems-- interbranch and departmental, which belong to different enterprises -- arrive at one and the same station. The striking distance between the economic work indicators of essentially identical works comes from this. The labor productivity in small transport shops that have one-two locomotives and neglected spurs, is fourfold-fivefold lower than for industrial rail transport on the average. The effectiveness in using locomotives here is 10-fold less than in large works and that for rail cars is 13-fold less.

An attempt was made 25 years ago to eliminate the lack of departmental coordination, centralize transport services, and free industrial enterprises from transport and loading and unloading operations that are unusual for them. It was suggested that specialized organizations assume all concerns about shipping and delivering freight. Part of the small and poorly developed shops of enterprises, their spurs, locomotives, and loading and unloading equipment were brought together in interbranch associations and enterprises of industrial rail transport -- PPZhT. They have proven their viability and effectiveness. Labor productivity here is far and away higher, and work costs are lower. The consumers have estimated this progressive form at its true worth. Those, who wish to transfer to it, are becoming more and more with each year.

After more than a quarter of a century of existence, why do these interbranch organizations own only a twentieth of the spurs and refuse to receive many of those, who wish, into the integrated transport service? Because the reorganization has not been brought to an end; it has stopped half-way. Instead of a serious improvement in the management structure, they have moved in accordance with the principle of Krylov's "Quartet"-- they have begun to change departmental subordination. At first, the interbranch organizations of industrial rail transport were attached to the RSFSR Ministry of Motor Transport and then, they were transferred to the Ministry of Railways. Even here, however, they have turned out to be "foreigners among their own, and they immediately fell into a position of being a pchild.

Whereas previously the USSR Gosplan allotted material technical resources and a special purpose management personnel staff to industrial rail transport, the ministry now receives everything. Within it, the requirements of the industrial railroad transport main administration are far from being in first place; the mainline spur lines predominate there. In the sub-branches, there is a chronic shortage of loading and unloading equipment, spare parts, units, and assemblies; and the repair base is practically nonexistent. The industrial rail transport interbranch organizations cannot assume the support of the transport departments of small enterprises because of insufficient capacities and a poor equipment level. At the same time, large enterprises, which have powerful transport facilities, prefer to manage with their own forces.

This, however, is only one side of the matter. The other consists of a management mechanism that has not been thought out. Departmental subordination has been dictated by an odd economic strategy. Industrial transport has fallen into the blinders of departmental indicators -- tons unloaded and shipped -- and has begun to work for itself, not service clients, and perform only those operations which permit the plan to be fulfilled more easily. The tonnage pressure has turned out to be stronger than good wishes. The progressive idea has entered a blind alley.

The directors of the Ministry of Railways are suggesting a prescription for deliverance from the anarchy in industrial rail transport -- merge it with mainline transport, transfer the transport and freight forwarding service to the Ministry of Railways, and eliminate the many organizations that feed near the transport cornfields. Many specialists, however, do not share this point

of view. For example, S. Chubarov, the director of Soyuzpromtrans NIIproyekt [All-Union Scientific Research Institute for Planning Industrial Transport] and a member of the USSR Academy of Sciences scientific council for complex problems in managing transport processes, and Academician G. Pospelov think that this is not enough to improve the situation. You see, the present flaws in the work of industrial rail transport interbranch organizations were engendered to a great extent by their subordination to the Ministry of Railways.

The tonnage pressure also predominates in other types of industrial transport -- motor vehicle and water. There is another reason in favor of the fact that service operations should be non-departmental. Today, when large-scale tasks are being advanced to accelerate the country's social and economic development, the destruction of the "patriarchal" character in such an important sub-branch as industrial transport and the shift to a modern management structure are becoming an urgent necessity. Here, even more than in mainline transport, the defects of departmental splintering appear. Their concrete expression consists of the dissipation of capital investments, the absence of a common technical policy, and enormous non-productive expenditures of labor and resources.

According to the most modest estimates, the operating expenditures of industrial transport exceed 30 billion rubles a year -- more than a quarter of all transport expenditures in the country. These are the same reserves which, as the 27th CPSU Congress pointed out, we have handy -- and whose use we have only to select.

The specialists see the way out in removing industrial transport from departmental subordination. Practically speaking, this takes the form of establishing a union republic interbranch body within the framework of a public center for controlling the transport complex. This body would combine all service transport -- rail, motor vehicle, water, and -- in the future -- conveyor, pneumatic container, etc. -- under its direction. We are essentially talking about the formation of a separate service sub-branch.

This body must develop the general directions for the development of all industrial transport, carry out common planning and investment policies, and solve questions concerning scientific and technical progress, including the establishment of new non-traditional types of shipping, cadre training, and cooperation with mainline transport.

Naturally, a radical reorganization of work on the spot is also required. Every precondition for this exists. Industrial rail transport interbranch enterprises amalgamated rail facilities of ministries and departments, and loading and unloading and transport-freight forwarding organizations in motor vehicle transport and on the railroads already exist in many regions. Their merging into powerful regional firms -- here is the main way to solve the problem. Thus, the question of a fundamentally new regional economic formation, which has complete responsibility for the safe-keeping of freight and its timely delivery, is arising.

It appears that it would be best to form such firms on the basis of large industrial transport enterprises regardless of their departmental subordination. These can serve as the basis for future interbranch associations. It is important to select leaders who possess a powerful and scientific and technical potential. It is also necessary to place them in a priority position and transfer to their subordination those enterprises which are working less effectively, having combined them organizationally under the aegis of kray ispolkoms and oblispolkoms.

There is such experience. When the harvesting campaign begins and motor vehicle transport is sent from all ends of the country to the agricultural rayons, staffs and centers for controlling shipments, which organize the work of the assigned motor vehicle transport and of the harvesting and loading equipment according to hourly schedules and the linkage with mainline transport and agricultural product reception points, are established in ispolkoms. Transferring the leadership of a regional firm to the ispolkoms will simultaneously strengthen the responsibility of local bodies for organizing the complete transport servicing of consumers, who are located on their territory, as well as that for regulating the freight flows in the region.

Without a doubt, it is necessary to establish in advance a new economic mechanism which would maintain the priority of the production workers. The specialists think that relations between the partners should be constructed according to the following schema: The consumer requests a cargo and indicates what, where and by what time it should be delivered.

Of course, the question is not a simple one nor is it indisputable. It is quite possible that other opinions on the organizational structure and economic mechanism for the activity of industrial transport exists. It is completely evident, however, that the problem is an important one that requires a very rapid solution -- especially now, when the task of earnestly increasing work quality and effectiveness has been imposed on transport workers.

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INTERSECTOR NETWORK DEVELOPMENT

IMPROVEMENTS FOR TRANSPORT SECTOR FINANCE STRUCTURE PROPOSED

Moscow EKONOMICHESKIYE NAUKI in Russian No 9, Sep 86 pp 67-74

[Article by N. Samsonov, candidate of economic sciences: "Questions of Improving the Transport Sector Finance Structure"]

[Text] The materials of the 27th CPSU Congress and a number of party documents adopted recently contain the convincing concept that the new economic tasks cannot be carried out without an extensive restructuring of the economic mechanism and the creation of an integrated, efficient and flexible management system which allows for a more complete and rapid implementation of socialism's enormous creative abilities. The 27th CPSU Congress Political Report makes special mention of the fact that "recently there has been a weakening of the effect of finance and credit on economics. The finance system does not adequately influence any increase in the efficiency of economics."¹ This gives rise to the need to increase the role of finance in strengthening the Soviet economy's planning entities and in achieving higher operational yields at lower expenditures. This need is equally urgent for all branches and areas of the current USSR economy but has a great and well-understood specific significance for transportation which is a most important infrastructural system and practically the only point at which the entire set of economic units participating in the socialist's society's reconstruction can truly interact.

When a unified national transport system has been formed and is operational, any improvement of the USSR's national economy is closely linked to the operation of this unified system, which must be harmoniously and efficiently incorporated in the common interest activities of all transport sectors. This incorporation also requires an appropriate transport finance structure which maximizes the correspondence between the needs of suppliers and consumers while maintaining a rational level of shipment timeliness and a rational level of expenditures for these shipments.

Common ownership of the means of production, the operation of the unified national economic complex (which includes transport operations) and the nation's unified financial system, in which market and currency relationships are carried out with their specific aspect of socialist content, form the simplest common basis which makes successful resolution of many national

economic tasks, including the financial aspects of transport work, both necessary and possible.

According to the "Fundamental Guidelines for the Economic and Social Development of the USSR During 1986-1990 and to the Year 2000" adopted by the 27th CPSU Congress, transport must handle significantly increasing cargo and passenger loads. During the 12th Five-Year Plan railroad cargos will increase by 8-10 percent and railroad passenger levels by 7-9 percent; motor transport cargos will rise by 18-19 percent and general purpose bus transport passenger volume will increase by 14-16 percent; aircraft passenger volume will be 17-19 percent higher.²

As indicated in Comrade N. I. Ryzhkov's report to the Fifth Session of the USSR Supreme Soviet's 11th Convocation, the 12th Five-Year Plan calls for a 17 percent increase in all types of cargo transport. This is to be accomplished through the establishment of more rational cargo flows in individual types of transport with an emphasis on increased efficiency, the introduction of technologies providing increased throughput and hauling capacity and increased fuel economy. All of these progressive advances require adequate financial support: 62 billion rubles of capital investment are being directed toward improving and reinforcing the transport sector's material and technical base.³

These investments will have an impact beyond the transport system itself. The development of transportation and shipment quality (meaning timeliness, safety, etc.) is having a direct effect on the entire process of extensive socialist reconstruction and on the scope, pace and efficiency of production. There is no need to point out that, all other conditions being equal, the acceleration of cargo deliveries to consumers means that supplementary resources are freed for production and consumption needs. In contrast, a slowing of deliveries brings about a need for new resources, increases the scarcity of these resources, disturbs the normal production cycle at enterprises and causes production resource underutilization as well as output losses, especially in agricultural products.

All this leads to the concept that, in some conditions, "overstated" expenditures for strengthening and improving the transport complex turn out to be optimal when approached from the position of a unified national economic complex as a whole, i.e. in the approach most justified under socialist conditions. Bearing in mind the goal of supplying the necessary pace of hauling capacity growth, the problem of proportionally developing transport and production will always be one of the most critical current problems. A solution to this problem should not, as so often is the case, lead only to recommendations for increasing transport's share of national capital investment, although such suggestions must not be avoided. As particularly pointed out by Ministry of Railways work in recent years, transport capabilities depend to a great extent on the best use of existing capacity. There must be widespread implementation of means of reducing the need for capital in shipping work. The goal is to extensively intensify and develop the positive tendencies toward more complete satisfaction of the national economy's needs in the area of transportation which have been established in the transport sector (particularly in the railroads) during recent years.

We know that the type of transport usually referred to as an independent sector of the national economy delivers products from the manufacturer's warehouse to the user's warehouse. Production, or for the lack of a better term "industrial," transport includes those shipments which support the manufacturing process up to the point at which the finished product reaches an enterprise's final product warehouse. The boundary between these two types of transport is not always clear in practice. Industrial transport does not just service enterprise manufacturing cargos, it also connects the enterprises to general-purpose transportation operating in the area of materials handling and forming the basis of the USSR's transport system. In addition to general-purpose handling transport there is also a departmental transport resource. Obviously as a whole these processes should be evaluated as positive and integrated means of achieving higher shipment efficiency in the entire system.

Increasing efficiency is thus taking on a special meaning in today's transport system and is objectively becoming established as a principle. The reinforcement and consolidation of this system at the national level and at the level of economic regions are creating conditions for improving utilization and interfacing various types of transport with full consideration of their advantages and relative disadvantages. On the other hand, prolonged self-support has given rise to enterprise (association) autonomy in the solution of national economic plan fulfillment problems (including some financial questions which used to be strictly regulated "from above"), which is providing better solutions in terms of specific means of organizing transport to suit the financial and production interests of both the supplier and the consumer. Implementation of this principle is obviously of extreme importance in carrying out the complex and demanding work assigned to transport workers by the 27th CPSU Congress. In the final analysis, the essence of the job at hand is to provide the national economy and the people with an efficient, smoothly operating and growing transportation system. Among other things, the resolution of this task, with its extremely varied nature, requires an overall approach to the study of transport finance problems.

Objectively, this type of approach is needed because in spite of all the differences between various types of transport, they are all characterized by production process uniformity, socioeconomic unity and a common thread to goals and problems. That common link is the need to satisfy the national economy and population's transportation requirements. We must stress that here we mean all types of transport.

This emphasis is taking on a special meaning because when speaking of the nation's unified transportation system we usually mean so-called "mainline" transport, i.e. rail, truck, maritime, river (inland waterway), air and pipeline movements. Each of these means of transportation is governed by appropriate transport ministries and departments and operates under the conditions set up by the state plan for the USSR's economic and social development. However, by no means is this the nation's entire transport system. In fact the entire system includes the activity of specialized transport subunits of the national economy's non-transport sectors. Here the degree to which these entities are encompassed varies; mainline transportation is of primary interest. While this attention should not be lessened, obviously there must also be more energetic efforts directed at integrating the

uncoordinated transportation efforts of other departments into the unified transportation system. This integration must include the use of financial assistance.

There are various forms and methods of coordination that can and must be exercised to achieve a unified transportation system: planning (including financial planning); regulation of technological and organizational aspects of cooperation between types of transport; and the creation of uniform legal documents, etc. for the entire transport system, including, but not restricted to, mainline transport.

Most of the difficulty in this coordination work involves the absence of adequate uniformity in differentiating transport activity by type. For example, in civil aviation there is no practical distinction between passenger and cargo transport. Much is being said now about means of properly developing coordination between types of transport such as shipment planning at the USSR Gosplan level. The transport management structure growing up at this time needs to be improved. There is a lack of adequate teamwork in developing equipment and technology for the individual types of transport.

The special organizational features needed for handling and managing shipments by transport type are causing divergences in the structure of secondary and auxiliary work which complicate the shipping process (loading-unloading, expediting, passenger servicing, etc.). For instance, loading and unloading can be done by transport personnel or by the shipper and consignee. While the amount of loading and unloading work handled in this manner is high in civil aviation, it is comparatively low in rail and road transport. In turn this situation causes a lack of uniformity in spending for secondary and auxiliary work by various types of transport.

Turning to the financial side one cannot fail to note that each type of transport has its own characteristics in terms of structuring operating expenses, accumulating revenue and financial resources, financing basic asset renovation and credit and clearing operations. Similarly, each type of transport reflects the financial situation in its sector of the national economy. Thus there is significant variation in the composition of each type of transport's operational costs due to the tremendous autonomy in each sector from the very start. We must bear in mind that the operational expenditures of the individual types of transport are not always comparable according to a list of calculated expenses. For example, track maintenance amounts to one-fifth of railroad transport expenditures, while the same type of maintenance is insignificant in maritime transport. At the same time, road and river maintenance is covered by budgetary grants. There are differences in the coverage of expenditures for loading, unloading and some other types of work. The approach to handling the distribution between passenger and cargo services also differs. This disparity distorts actual expenditures for cargo and passenger operations and the financial results of operational activities in the various types of transport enterprises. Deviations in transport costs are expressed in shipping rates and consequently in the expenditures of those enterprises which are provided with transport services.

Therefore, the establishment of a comparable group of operating expenditures included in the shipping costs of all types of transport is an important condition for future improvement of the shipping rate system. There must also be further improvement and standardization of the system for allocating operating expenses between cargo and passenger operations. This would allow increased soundness in the system of differentiating shipping rates according to transport type. It is of course understood that shippers and consignees cannot solve questions of transport efficiency on the basis of a solid cost accounting approach or link these questions to improved realization of national economic interests until the serious problems outlined above are solved in standardized manner based on a uniform methodological approach.

The Soviet Union's unified transport system permits the minimization of total labor costs involved in producing and shipping products, rational utilization of each type of transport on the basis of its technical and economic characteristics and within its range of efficient application, planned interaction between types of transport and the assurance of proportional and highly efficient development of the nation's entire transport system. Establishing the limits within which each type of transport can be used most efficiently is the starting point for a solution to the problem. A high operating efficiency level for the entire transport system assumes first of all the satisfaction of transport needs while keeping each type of transport within the limits of its most profitable operation.

As we all know, rail transport occupies a leading place in the nation's transport system as it provides dependable and regular cargo movement between the nation's various regions. The railroads carry about nine times more cargo than passengers. At the same time they carry a far greater share of both cargo and passengers than any other form of transport.

Air transport has the advantage in carrying passengers over medium and long distances. It is characterized by high throughput and shipping speed. Considering the high shipping cost, most of its cargo is destined for roadless areas which are difficult to access or results from urgent delivery requirements often caused by poor discipline on the part of the shipper.

The cost of water-borne transport is lower than that of rail shipments but the speed involved is also lower. River transport is restricted and seasonal in nature. Therefore, it is primarily used to carry mineral construction materials, wood, oil and other cargos which are not usually urgent. River transport is much more important in those areas where the road and rail network is limited. Waterways (seas and major rivers) do not require high capital outlays but costly port facilities are need.

Maritime transport mainly serves as the link between the Soviet Union and foreign countries. It also services internal areas of the Soviet Union which have access to seas. Interurban or local passengers make up most of the maritime or river transport passenger load.

Truck transport is involved in more than one-fourth of rail shipments and a major part of river and maritime shipments. It is characterized by a small cargo capacity per rolling stock unit and by costs that are second only to

civil air transport. Truck transport is quite fast and flexible, therefore, it is especially suited to short-distance shipments. It handles interurban and local cargo and passenger needs. Obviously it is used more extensively in those areas of the nation where road transport is practically the only means of transportation. Road transport handles more cargo tonnage than any other type of transport, about four-fifths of the entire cargo volume.

Pipeline transport (subdivided into gas, oil and petroleum product pipelines) is characterized by a high degree of specialization.

On the whole, transportation is capital- and labor-intensive. Air transport requires the most capital and is the most costly to operate. It is followed in descending order by road, river, rail, maritime and pipeline transport. Accelerated development of pipeline transport is one means of reducing transport capital requirements (see Table 1).

We must bear in mind that a means of transport's range of efficient operation cannot be established once and for all. In fact it basically changes according to advances in transportation science and technology and a number of other factors. For instance, the current "Methodological Instructions on the Technical and Economic Basis for Logically Distributing Cargos from Rail to Road Transport" recommend shifting short-haul cargos from rail to road transport. However, this recommendation fails to consider two of the most important factors encountered under the present conditions. First, the increase in scarce fuel and labor expenditures it would require and, second, the restriction of road transport's area of most effective application (due to higher fuel costs). It would seem that the degree of scientific and methodological thoroughness in solving these problems should be higher in light of the 27th CPSU Congress' decisions. The method of calculating the overall expenditures involved in shifting cargos between transport systems needs to be made more precise. This is especially important for optimizing the transport system's structure and correctly identifying the transport factor during production planning.

Table 1

FREIGHT VOLUME OF ALL GENERAL-PURPOSE TRANSPORT (billions of tons/km)

<u>Year</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>
1940	494.4	420.7	24.9	36.1	3.8	--	8.9	0.02
1960	1898.3	1504.3	131.5	99.6	51.2	12.6	98.5	0.56
1970	3960.6	2494.7	656.1	174.0	281.7	131.4	220.8	1.88
1984	7682.1	3638.8	933.0	264.3	1370.3	997.3	475.1	3.28

1 All types of transport
including:

2 Railroad
3 Maritime
4 River

5 Pipeline (oil & petroleum product pipelines)
6 Gas pipeline (Ministry of the Gas Industry)
7 Truck
8 Air

Table 2

PASSENGER VOLUME OF ALL GENERAL-PURPOSE TRANSPORT (billion passengers/km)

<u>Year</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>
1940	108.7	100.4	0.9	3.8	3.4	0.2
1960	254.7	176.0	1.3	4.3	61.0	12.1
1970	561.2	273.5	1.6	5.4	202.5	78.2
1984	990.4	364.0	2.5	5.9	434.0	184.0

1 All types of transport
including:

- | | |
|------------|--------------------------------|
| 2 Railroad | 4 River |
| 3 Maritime | 5 Road (general-purpose buses) |
| | 6 Air |

The USSR's transport system, including all vehicles, equipment, railways and roads, involves one-sixth of the national economy's production assets, over 10 percent of total capital investment in the nation's economy and about 11 million workers. The Soviet Union has a huge and far-flung transportation network which includes 144 thousand kilometers of railroad lines, 793 thousand kilometers of hard-surface, general-purpose roads, 865 thousand kilometers of air routes (not including overlap) within the USSR, 138 thousand kilometers of navigable inland waters, 165 thousand kilometers of gas pipelines and 78 thousand kilometers of oil and petroleum product pipelines. All of these assets support a rapid pace of both cargo (Table 1) and passenger (Table 2) volume increase.

Effective operation of the nation's transport system requires reinforcement of the overall approach to carrying out the tasks involved in its development. The decisions of the 27th CPSU Congress are directly targeted toward restraining departmental interests in transport facility construction project planning, in regional siting, in road and track network and transportation node development, in the formulation of general plans for developing individual types of transport and in the selection of the most economical means of solving transport problems. Only this approach permits optimization of the unified transport system's structure and assures its operation at the lowest possible financial, labor and material outlays.

The solution to the problem of coordinated development and operation of the nation's unified transport system lies in extending the scope of transport integration processes. The solution inevitably influences the organization of finances for individual types of transport as it moves these latter closer together because in the future more coordinated interaction in the management process, including financial management, will be required within the scope of the unified transport system. The prerequisites for this are in place.

As we know, transport's role of moving cargos, passengers, baggage and mail directly defines it as a branch of production. Transport's production process is primarily characterized by individual features which distinguish it from

other material production sectors. Its main feature is the absence of a material product. In the words of K. Marx, "...The transport industry sells movement itself. Its beneficial effect is directly linked to the hauling process, i.e. to the transport industry's production process. People and goods travel on a means of transport whose movement is in fact the very production process it creates."⁴ In other words, the benefit created by transport consists of moving cargos and passengers from one area to another. Correspondingly, at times there is a coincidence of final product production and demand in transport and, as a result, transport production asset turnover takes place in two stages rather than three. Basic assets make up the largest part of the production asset structure (more than 90 percent). This is due to transport's high asset demand as expressed in the large share of amortization deductions within the structure of hauling expenditures and in significant outlays for vehicle maintenance and repair to assure reliability and safety. Transport's share of salary and amortization writeoff expenditures is markedly higher than that of industry.

Hauling estimates (including both cargo and passengers) are primarily forecasts, i.e. they are made prior to performance. Transport, especially those forms in which the hauling process includes more than one transport enterprise, is characterized by a high degree of financial asset and accumulation centralization. This is caused by the unique nature of transport production, interdepartmental financial relationships in connection with the redistribution of hauling revenues among transport enterprises and finance arrangements for operating expenses, capital expenditures and overhaul costs. All this is the source of the specific self-support structure developed in the transport sector (the use of cost accounting to determine enterprise revenue, etc.).

The transport industry accumulates monies earned through charges for hauling passengers, baggage, goods and mail (after the deduction of costs) in only one form--profit. The pipeline industry is an exception since, in addition to profit, monies are received in the form of a turnover tax.

In the budget, payments from profits take place in two ways: as asset fees and as net surplus profit fees. Unlike other sectors of the economy, as whole the transport industry's asset fees significantly exceed all net surplus profit fees. The transport budget has the highest share of profit writeoffs in the national economy. As a result of increased transport efficiency, since 1978 not one of the types of transport has received a budget subsidy for a basic operational activity.

As has already been indicated to some extent above, there are considerable differences in the finance structures of the various types of transport. This has primarily occurred because of the lack of an overall approach and affects financial arrangements with higher agencies, the budget, banks, transport service users, etc. Financial coordination of the activities of the transport complex as a whole assumes the implementation of efforts directed toward formulation of the needed recommendations and unified approaches. A single rate system for the entire transport industry, correlated by type of transport, is particularly needed to assure that each type of transport operates within the limits of its greatest benefit to the national economy.

Without such a system the local hauling efficiency of transport and user organizations cannot be reliably linked to efficiency in cargo and passenger handling operations in terms of the national economy. The new management system in this country brought to some transport enterprises in 1986 must play an important part here. Specifically, this system is called upon to bring into being the 27th CPSU Congress' directives on better utilization of financial capacity as a planning tool in the national economy "to increase production efficiency and economic conditions, improve product quality, renew basic assets, accelerate working capital turnover and reduce the costs of production while increasing its profitability."⁵

The last observation which this article must make involves an important aspect of finance activity in the transport sector: the magnitude of transport costs and means of reducing these. In all, these costs exceed 90 billion rubles per year. Usually the problem of reducing transport costs in the national economy is associated with expenditures for the labor of specialized transport organizations used in the process of hauling passengers and freight, loading and unloading operations and in carrying out other work in this field. We must emphasize that a distinction should be made between "transport costs to the national economy" and "transport costs." The first involves the cost of all transport services while the second involves the operating expenditures of the transport enterprises themselves.

The problem of reducing transport costs must be solved through the rational allocation of productive forces, development of optimal cargo flow plans and elimination of two-way hauls. Transport cost evaluation and planning are underway at this time in the national economy. This work covers expenditures for the transport work involved in moving cargos from the supplier to the user. No distinction is made here between work carried out by specialized transport organizations or by the shipper's or receiver's own transport associations, enterprises or organizations. Expenditures for all types of internal production transport processes which involve the movement of goods during the production process are not included in transport costs. However, expenditures for the movement of intermediate products, assemblies, materials and other cargos delivered under external production cooperation agreements with subunits (production units) located in separate areas but belonging to the same production association are included in these costs. Transport expenditure planning includes all ministerial and departmental sectors (industry, construction, agriculture, commerce, etc.). To be sure, transport cost evaluation and planning in accordance with the instructional directives released on 22 June 1984 by USSR Gosplan, USSR Gosbank and the USSR State Committee for Prices is not an easy matter. But, in the light of the demands by the 27th CPSU Congress to intensify the fight against poor management and waste, to assure rational and economical resource utilization, an adequate solution must be found rapidly by increasing the role of finance and credit in raising production efficiency. It is true that this work has already begun, but experience shows that it still has not achieved the expected result due to the onset of formalism.

FOOTNOTES

1. "Materialy XXVII syezda Kommunisticheskoy partii Sovetskogo soyuza" [Materials on the 27th CPSU Congress], Moscow, 1986, p 34.
2. Ibid., pp 307, 308.
3. PRAVDA, 19 Jun 86, p 3.
4. K. Marx and F. Engels, "Soch." [Complete Works], 2nd ed, Vol 24, p 64.
5. "Materialy..." op. cit., p 332.

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MOTOR VEHICLES, HIGHWAYS

GENERAL DIRECTOR ON ZIL MODERNIZATION, EXPANSION

Moscow ZA RULEM in Russian No 11, Nov 86 pp 1-2

[Interview with ZIL [Moscow Motor Vehicle Works imeni Likhachev] Association General Director Yevgeniy Alekseyevich Brakov under the rubric "The Policy of the 27th CPSU Congress": "Reconstruction"; first two paragraphs are source introduction]

[Text] Motor-vehicle building has always been among the most dynamic sectors of the Soviet economy. Among the most important tasks posed to it by the 27th CPSU Congress for the 12th Five-Year Plan is improving the structure of motor-vehicle production and, in particular, substantially increasing the production of diesel vehicles. The end result is to reach the point where in 1990 the share of freight shipping carried by trucks and tractor-trailers with highly efficient diesel engines is 60 percent. And this means that the annual output of these vehicles should total 40-45 percent.

Among the enterprises that should introduce new capacity for the output of the promising diesel trucks in the current five-year plan is the ZIL Production Association, which this year is marking the 70th anniversary of its founding. Association General Director Ye. A. Brakov received a correspondent of the journal and answered his questions, a considerable portion of which were contained in readers' letters.

[Question] Yevgeniy Alekseyevich, what event do you consider most important in the history of ZIL, formerly AMO [Moscow Motor Vehicle Society] and ZIS [Motor Vehicle Works imeni Stalin]?

[Answer] The October Revolution, of course: from it we reckon all of the successes and most important milestones of the 70-year path of development. As a matter of fact, when a group of entrepreneurs founded a motor-vehicle plant in Tyufelelevaya Grove near Moscow on August 2, 1916, it was difficult to foresee its future. The AMO could have grown into a capitalist enterprise like the Putilovskiy, Sormovskiy or Russko-Baltiyskiy plants. The AMO could have vegetated, like hundreds of enterprises of tsarist Russia. Great October changed its fate at the roots, as it did the fate of the whole country. And today, when on the agenda is the most rapid possible realization of the targets of the 27th Party Congress, a restructuring, acceleration of technical

progress and a break with conventional thinking, we sense behind them the indomitable nature of the revolutionary transformations begun in October of 1917.

These words, if slightly elevated, in my opinion precisely describe the most important event in the life of the AMO Works, which later grew into the ZIL Production Association.

[Question] Just what is the ZIL Association and what is the distribution of labor among its enterprises?

[Answer] The AMO Plant was modestly conceived in 1916--fifteen hundred one-and-a-half-ton trucks a year. The modern ZIL manufactures more than two hundred thousand motor vehicles a year of four different families (ZIL-130, 131, 133 and 157) in several dozen versions which are exported to 50 countries around the world. Our production association was formed in 1971. It is some 16 plants located in 12 different cities of the Soviet Union. In other words, it is a large motor-vehicle firm, a socialist firm. It is simpler to conduct a unified technical policy through combined efforts, and progressive equipment and technology can be incorporated more rapidly. A clear specialization has been set up here. There are casting plants and enterprises for the output of engines, transmissions, front and rear axles, brakes and spare parts.

We supply other plants in the sector cooperatively with many parts and manufacture special and non-standard equipment and process tooling as well as household refrigerators and dozens of types of other consumer goods.

The lead plant, located in Moscow, of course plays a leading role. It stretches over several city blocks, includes foundry, forging, press, body, mechanical machining and tooling production and conducts the assembly of motor vehicles.

In the 12th Five-Year Plan, we have to prepare the production and begin the output of the ZIL-4331 family of diesel freight trucks (ZA RULEM, 1984, No 3--Ed.). Two new plants of the association are being built in Yartsevo, in Smolensk Oblast, for this purpose. One will manufacture diesel engines, and the other will supply it with cast iron. The precision fuel apparatus will be obtained from Zhitomir, where a wing of yet another of our branches is being built. The vehicles will be assembled in Moscow at the lead plant, where they will have to build a new body and press-welding wing. All of the plants will operate as a unified entity, and are therefore an extremely efficient complex economically.

[Question] How is the construction of the new production space going?

[Answer] We'll start with the lead plant. The shell of the single-story portion of the press-welding wing has already been installed, and by the end of the year the roof and foundation for the equipment is projected for completion and this part will be handed over for heating installation. In the high-rise portion of the wing and the body wing, the metal structures will be installed before the end of the year.

As for the Yartsevo Diesel-Engine Plant, the installation of the shell using fully assembled construction blocks is underway. Each block is 24 by 12 meters in size--these are girder structural elements and coverings of prepared roofing and previously installed piping and air and electrical lines along with lighting. Imagine how efficient this is! This wing has 780 blocks, and the whole installation is planned for completion in December.

At the specialized cast-iron plant in the same town of Yartsevo, we are installing melting furnaces, molding lines and other process equipment. By the end of the year, we will place the whole start-up complex into operation, which will begin to produce cast iron.

And as for Zhitomir--there we are constructing a fuel-apparatus plant at the Avtozapchast [Motor-Vehicle Parts] Plant base at which we want to complete the installation of the main wing this year and begin the installation of equipment in 1987.

It seems slow to you? But what an enormous object we are raising up! After all, we are also continuing to develop other enterprises: we are building new shops at the Ryazan Motor-Vehicle Assemblies Plant and the Mtsensk Aluminum Casting Plant. We are thus operating on a broad front.

[Question] Will the output of diesels begin in Yartsevo right away, or will some other enterprise of the association serve as a temporary production base?

[Answer] Before the entry into service of the new wings in Moscow, Yartsevo, Zhitomir and other cities, we have resolved to begin the so-called accelerated production of assemblies for the new vehicle at our existing plants. The Ural Motor Plant is manufacturing diesels on flexible production systems, the Smolensk Motor-Vehicle Assemblies Plant is making transmissions, and more than 450 parts and assemblies that will be produced by the new press-welding production facilities are being made in existing subdivisions of the association.

I want to emphasize that the finishing of the motor vehicle and the timely and precise assimilation of the new-model truck depend to a considerable extent on our successful assimilation of this accelerated production. It will aid us in exposing weak points in the engine and vehicle overall and to elaborate the design and technological documentation before the start of mass production.

[Question] When is the completion of reconstruction and the conversion to the new base model projected?

[Answer] We are planning to prepare the first phase of new and reconstructed facilities that we were discussing in 1988, creating in that way capacity for the output of 70,000 diesel trucks a year.

[Question] At one time, in speaking of the reconstruction of AMO, the first in the history of the plant, I.A. Likhachev expressed it thus: "We have sewn the buttons onto the coat." How does one imagine the scale of today's reconstruction?

[Answer] Over the history of our association, this is the fifth reconstruction. Ivan Alekseyevich Likhachev uttered those words in 1931. He was comparing the fixed capital of the previous and the new plants of AMO, which was equal to 8 and 87 million rubles respectively.

The current reconstruction has encompassed not only the construction of new wings, but the incorporation of fundamentally new equipment as well: machine tools with numerical program control, flexible technologies and robotized complexes. Thus, we are not only expanding the production front, but we are qualitatively rebuilding it as well. If we evaluate the scale of the reconstruction in general, then it must be said that the ZIL Association, as a result of its implementation, is getting a "new coat."

[Question] Among drivers there are many adherents of ZIL-made vehicles. Without diminishing the merits of the trucks of other makes that are operated in our country, how is this affection explained, in your opinion?

[Answer] We apply great effort to keep the reputation of the ZILs at a high level. And, judging by the multitude of mail, the ZIL trucks are prized for their high reliability, simplicity of maintenance and repair, ease of handling and good maneuverability and dynamic qualities. Drivers are inclined to be proud of these merits, subconsciously linking them with their professional qualities. They feel a common bond with the firm and, correspondingly, the firm, that is, we, should pick up on this reciprocal link and reinforce it with deeds. I think that ZIL has been able to create such a link, perhaps, a little better than other plants.

But these are more of psychological hypotheses. If one were to use engineering language, one must make the perfect vehicle. If the plant lags behind technical progress, then goodbye to the many years of attachment on the part of both drivers and economic planners.

[Question] Your association has repeatedly been a Soviet motor-vehicle pioneer: the first fully powered three-axle vehicles, the first trucks with five-speed transmissions, the first trucks with eight-cylinder engines and power steering. I would like to know what prospects of the new family set the tone not only for domestic truck production, but for world production as well.

[Answer] In creating the ZIL-4331 family, we tried to instill in its design and technology engineering solutions that would be of a progressive nature. High fuel economy, productivity, safety, the level of driver comfort--these were the four basic directions of work on the new vehicle.

Thus, the ZIL-4331 is equipped with the ZIL-645 diesel, which is roughly 30 percent more economical than its carburetor predecessor, and its power has been enhanced by 24 percent and torque by 27 percent. As a result, we have been able to increase the freight capacity of the tractor trailer by 2.5 tons.

A brake system with separate drive and automatic regulation of clearances in the working brake ensure increased safety.

The high level of the driver's working conditions will make it possible to raise the productivity of the truck--driver system. It is created, in particular, by a more spacious cab, a spring-loaded and regulated driver's seat and a steering wheel that can be regulated by position. The so-called integral hood of the engine allows convenient access to all of its systems, easing maintenance.

Overall, the new-family trucks are up to the modern technical level of world truck building. Tomorrow's too, moreover, insofar as the design is calculated for the incorporation of improvements in the future, which will ensure the further raising of the technical level, efficiency and longevity of the vehicle. They are programmed by our specialists.

[Question] The words "longevity," "quality" and "efficiency" are on everyone's lips today. How can these characteristics be described in numbers as regards the ZIL trucks that are produced today and being prepared for production tomorrow?

[Answer] We are now producing trucks in the ZIL-130 family, which began coming off the line in 1964. Over the last twenty-two years, the life of the base model to the first capital repair increased from 150,000 to 350,000 kilometers, and the engine from 100,000 to 300,000 kilometers. The freight capacity of the trucks was increased, moreover, and the labor intensiveness of its maintenance was reduced.

In evaluating quality, I note that the level of complaints against the ZIL-130 is small. Over the course of the last five years, it has totaled less than 1 percent. Moreover, as a result of a series of technological and organizational measures, a trend toward a reduction in the quantity of complaints has currently been noted.

The new ZIL-4331 family promises to be more efficient in freight shipping than the ZIL-130. This is first and foremost thanks to increased productivity. They are designed for operations in the complement of tractor trailers, and the entry into service of only the first phase of capacity for their output will make it possible to free up tens of thousands of drivers. Everything in the design of the new vehicle facilitates an increase in productivity: the eight-stage transmission, the comfortable cab and the improved suspension that makes possible a higher average operating speed.

From the point of view of economic efficiency, we should speak especially about the diesel engine, which, I repeat, is much more economical than a carburetor one. In numbers, this means that the 70,000 ZIL-4331s that will go forth to replace a like number of ZIL-130s will consume a million tons less fuel in a year.

And, returning to the beginning of your question: the service life of the ZIL-4331 to the first capital repair, as tests established in 1985, is 400,000 kilometers. This is an indicator that is of world standard.

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MOTOR VEHICLES, HIGHWAYS

ADVANTAGES OF NATURAL GAS-DIESEL ENGINES REVIEWED

Moscow ZA RULEM in Russian No 10, Oct 86 p 2

[Article by Candidates of Technical Sciences V. Karnitskiy and P. Ozimov under the rubric "The Policy of the 27th CPSU Congress": "Gas-Diesel"]

[Text] The replacement of liquid petroleum fuels for powering transport internal-combustion engines with other types of fuels, and especially natural gas, is a most important national-economic task. The motor builders, in conjunction with the workers of the gas- and oil-refining industries, have been called upon to resolve it. It should be noted here that gas--both natural and the by-products of the raw-material refining industry--is acquiring more and more significance in the power equation of the country each year.

Gas resources in the USSR make up a considerable share of world reserves, while in the volume of its production our country occupies one of the leading places in the world. Consequently, there is a reliable technical and economic foundation for the widespread utilization of this fuel not only in industry and municipal services, but for motor transport as well.

Natural gas is 94-99 percent methane and has a calorific value of 8,000-8,200 kilocalories/cubic meter. It can be employed in motor vehicles in liquified or compressed gas form. Compressed natural gas stored on board the vehicle in steel cylinders at a pressure of 20 megapascals (200 kilograms of force/square meter) is the most widely disseminated.

The basic advantages of using gaseous fuel in place of liquid ones is a reduction in wear on the principal parts of the piston-cylinder assembly and an increase in engine service life along with a reduction in the toxicity and smokiness of exhaust gases, consumption of motor oil and, finally, lower fuel cost.

Internal-combustion piston gas engines are distinguished by three basic traits: method of igniting the working mixture, type of mixture formation and the number of strokes.

The method of igniting is brought about by the specific nature of the working process and the basic parameters of the engine. Gas internal-combustion

engines are divided into three basic types according to this trait: spark ignition, igniting from a starting (initiating) dose of liquid fuel and pilot ignition.

Although these engines differ, common to all of them is the ignition of the gas-air mixture from an outside source, that is, forced ignition: it has not been possible to implement the method of ignition from compression that is used in diesels. One obstacle is the high temperature for gas self-ignition (650-720 degrees Celsius), which considerably exceeds this indicator for diesel fuel (320-380 degrees Celsius).

Gas engines with external (outside the cylinder) mixture formation and spark or pilot ignition are currently widely employed both in this country and abroad. Diesel motors operating on gas are much less widespread. Today they are chiefly shipping and stationary engines associated with various types of power-drive assemblies, as well as gas-motor compressors.

With the growth of the diesel truck and bus fleet around the world, including in the USSR, it has become expedient under certain circumstances to operate employing a mixture of natural gas and diesel fuel for powering engines (the work of dump trucks in quarries, buses and municipal trucks within city limits, trucks in gas-producing regions and the like).

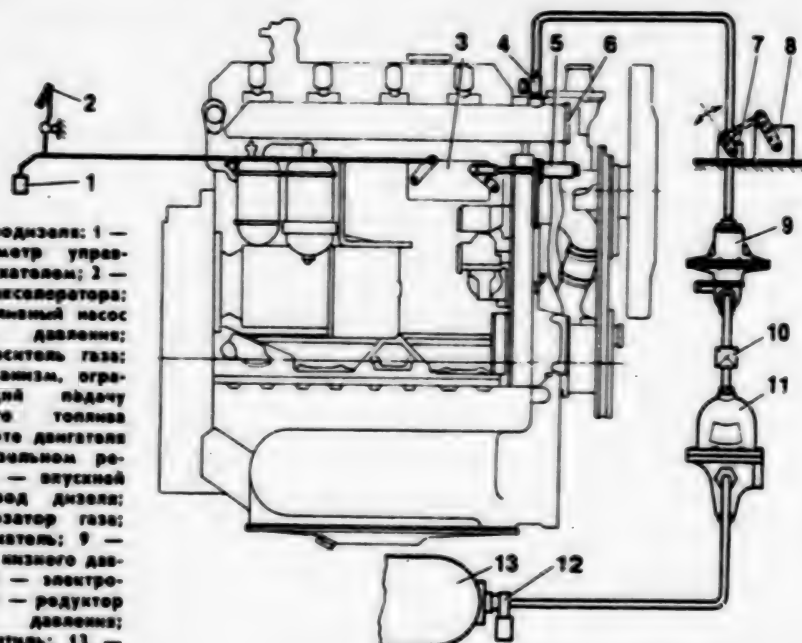
There are two principal ways of converting diesels to gaseous fuel: converting the diesel into an engine with a spark or pilot ignition or a conversion to the gas-diesel process.

The first method is connected with substantial revisions in design (changing the piston for reducing the degree of compression, the rods, the intake system, creating a system for spark ignition etc.) and, correspondingly, with considerable expenditures. The engine in this case becomes purely a gas engine and cannot operate using diesel fuel. The simplest and most efficient and economically expedient method is the second one, where the possibility of rapid conversion from gas fuel to liquid and back is retained.

A series of changes is also being introduced to the design of the engine: a gas mixer, a mechanism for limiting the feed of diesel fuel, a system for regulating gas feed and a device for the interconnected control of the fuel pump rod and gas feed are being added. In this method, the gas-air mixture rather than air enters the air intake, ignited by a small ("igniter") dose of liquid fuel injected through the basic fuel-system nozzle. It is known as the gas-diesel or and liquid-gas process.

A minimal quantity of "igniter" liquid fuel determines the power required for ignition and the fuel combustion of the gas-air mixture. For high-speed transport diesels, the dose of igniter fuel is 10-20 percent, while for large stationary and shipping diesels it declines to 5-8 percent, consumed in the diesel process.

Схема газодизеля: 1 — потенциометр управления пускателем; 2 — педаль акселератора; 3 — топливный насос высокого давления; 4 — смеситель газа; 5 — механизм, ограничивающий подачу дизельного топлива (при работе двигателя в газодизельном режиме); 6 — впускной трубопровод дизеля; 7 — дозатор газа; 8 — пускатель; 9 — редуктор низкого давления; 10 — электроклапан; 11 — редуктор высокого давления; 12 — вентиль; 13 — баллон со сжатым метаном.



Gas-diesel diagram: 1--starter control potentiometer; 2--accelerator pedal; 3--high-pressure fuel pump; 4--gas mixer; 5--mechanism limiting the feed of diesel fuel (when operating the engine in the gas-diesel mode; 6--diesel intake pipe; 7--gas meter; 8--starter; 9--low-pressure regulator; 10--electric valve; 11--high-pressure regulator; 12--valve; 13--tank with compressed methane.

The figure shows one diagram of a gas-diesel. Gas from the cylinder, where it is under a pressure of 20 megapascals, passes through a high-pressure regulator (where it is reduced from 20 megapascals to 0.3-0.4), an electrical valve, a low-pressure regulator (a further reduction from 0.3-0.4 megapascals to 200 pascals), a gas meter pump and a mixer and arrives at the engine intake line. When operating in the gas-diesel mode, the diesel-fuel feed is limited by a special device. The feed of liquid fuel and gas is also controlled with the help of the accelerator pedal, connected both to the fuel pump and to the meter pump. For start-up and idling, diesel fuel is used, as a rule, and in the other modes, including high-speed and loaded modes, gas is employed.

The principal difficulties in creating transport gas-diesels are connected with the fact that the modes of operation for truck engines are quite broad and change rapidly over time. A consequence of this is that it is difficult to ensure the most advantageous correlation of air, diesel fuel and gas and their efficient combustion with high fuel economy and low soot exhaust.

It is necessary to match up the elements of the gas-metering and gas-mixing devices carefully in order to solve this problem. It is also very important to find the best profile for the performance of the diesel-fuel pump in the feeding of the igniter dose. Only through the observance of the indicated conditions will the engine operate on a mixture of natural gas and diesel fuel efficiently and without accidents.

Although the principle of transforming a diesel into a gas-diesel is theoretically simple (the feed of gas into the diesel air intakes with the simultaneous limitation of liquid-fuel feed), it is more complex to implement it in practice than it would appear at first glance. Proof of this is the absence of any developed and disseminated designs of gas-diesel vehicles abroad today, although the Italian firms Landi Rentso and Tartarini and a number of firms in Japan and the FRG hold patents for these power systems.

For us in this country, as has already been noted, the use of natural gas in the diesels of large-load trucks and buses is expedient. The incorporation of the gas-diesel process will permit a 75-80-percent economy of diesel fuel thanks to its substitution with natural gas, and will reduce the smokiness of exhaust gases for a wide range of loaded modes by two or three times. That is why the specialists of NAMI [Central Scientific Research Institute of Automobiles and Automobile Engines], in conjunction with the leading motor-building plants, have done much work on refining this process in recent years. Based on the results achieved, it has been possible to create several gas-diesel versions of series-produced motors. The output of these engines at KamAZ [Kama Motor Vehicle Works] and the Yaroslavl Motor-Building Association is projected to begin in the near future.

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MOTOR VEHICLES, HIGHWAYS

CYCLISTS FACE OBSTACLES IN OBTAINING MOTORCYCLE FUEL

Moscow ZA RULEM in Russian No 10, Oct 86 p 3

[Article by Master of Sport B. Demchenko under the rubric "Economically and Thriftily": "How to Fuel the Motorcycle?"]

[Text] Skips suddenly started in the even roar of the engine, and then more, and more--and just then I saw a gas-station sign at the side of the road. "So it turned out fine: down to the last drops, but I scraped through anyway!" I thought and, taking it out of gear, I turned right and with an already silent engine coasted into the expansive and strangely deserted expanse of the station. Having come to a stop, the first thing I did was to glance into the fuel tank. At the very bottom, the last drops of fuel that even the short pipe of the "reserve" had been unable to pump out splashed about. Happy about my good fortune once again, I got my coupon and money and went to the attendant.

The dialogue with her, complicated by having to be conducted through the narrow slot for the coupons, was brief:

"Can I fill up the motorcycle?"

"Read the notice: this is a departmental station of the Obninsk Passenger Motor Transport Enterprise, fill up across the way."

I looked around and really saw a small silver booth and two pumps near it. A container station! That's what I needed!

I boldly crossed departmental territory and came up to a little window once again--a slightly wider one.

"Can I fill up the motorcycle?"

"Go ahead."

"Do you have any oil?"

"No oil."

"And the tank?"

"What tank?"

"The tank where you mix the oil with the gas!"

"We don't have one."

"How can that be? I can't even go 100 meters from here--I'm out of fuel!"

"I think they have some oil, across the way... Ask them."

I went back through the yard the other way.

And there--wonder of wonders!--it turned out that they had oil and sold it for cash. I bought this oil (its exact name remains unknown) and poured what looked to be about a half-liter into the fuel tank, then pushed the motorcycle to the container pump and added 10 liters of gasoline. The motorcycle, of course, smoked a little (there was oil in the fuel line!), but then it dispersed and I went on my way...

There are varying data on the number of motorcycles in personal use. The official statistic based on the number of registered motorcycle transport cites 15 million; according to the unofficial evidence of taking into account those motorcyclists who use rural roads without registrations, they exceed 20 million in number. A good 90 percent of this number have two-stroke engines, that is, engines that require the preparation of the fuel mixture. Moreover, the gasoline is mixed carefully with the oil: only in that case is the quality of cylinder and bearings lubrication and the complete combustion of the fuel ensured.

Good lubrication is the pledge of long engine life. The complete combustion of the fuel mixture is one of the conditions for achieving the nominally theoretical technical parameters and the least toxicity. Consequently, a concern for the normal refueling of a motorcycle is not at all just the private matter of its owner but is, without any exaggeration, a question of national importance.

It is both sad and funny to talk about refueling today. Sad because as recently as in the early 1960s there were no such problems. Special pumps existed at gas stations and operated correctly, preparing the "two-stroke" fuel mix and dispensing it; there were even coin-operated machines that gave out 2.5 liters of mixture for 15 kopecks anytime day and night without the participation of an operator. Even the most backwater stations in those days had simple mixers--tanks for the independent preparation of the mixture. What happened to all of this? And the main thing--with whose consent?

It is funny to write about this because the discussion is not about some computerized or imported or I don't know what kind of equipment, but just the simplest bucket with a spout from which the fuel mixture could be poured conveniently into the tank of the motorcycle.

But maybe this whole discussion is for nothing? The motorcyclists are getting around! They're filling up somehow. And not complaining.

By the way, why aren't they complaining?

In order to answer this question, we must look a little more intently at the face of the motorcyclist himself: just what is he like?

The motorcycle today is primarily a rural form of transportation. It is probably 70-75 percent rural. And, at the same time, young. And a young man in the towns--in the overwhelming majority of cases--is either a driver or a mechanic. That is, a worker who has direct access to fuel and oil.

Keeping in mind the inadequately arranged accounting for fuel consumption (and it is not even arranged clearly in the city, never mind the towns...), the distance of the towns from the station and the complete lack of conditions for normal refueling of motorcycles in them, and adding to that the business of the young man and the lack of free time (not to mention the lack of a number plate or "rights"), it becomes obvious that under these conditions that state fuel and oil is easily mixed in a personal bucket and poured into the motorcycle tank without complications.

And just who, tell me now, will complain, and against whom?

The remaining 20-25 percent are urban motorcyclists (this is roughly 4 million people) scattered among towns and roads, not noticeable compared to 13 million automobile owners, and therefore just "drop out of the sight" of the unobtrusive USSR Goskomnefteprodukt [State Committee for the Supply of Petroleum Products] system.

During the very same trip with which I began this story--and this was a dedicated editorial trip on the theme elucidated in the title--I stopped in at the gas-filling station at the intersection of Kashirskoye Highway and the Moscow Ring Road. And it was as if I had landed in another world. The driver doesn't get out of his car, he doesn't touch the pump hoses. The operator does his thing precisely and confidently--that which he is paid for. The area of the station is ideally clean, well-ordered and safe from fire.

And there I remembered the motorcycle: why can't we create such a situation in this case? Or does gasoline burn worse than oil?

The motorcycle engine is right below the fuel tank. In pouring the fuel into the tank in a tight stream from the handle, we almost always risk spilling on the motor, and that means starting a fire when starting it up. And this is at the pump, next to motor vehicles.

The fuel tank of my motorcycle holds 17 liters of fuel, and the motorcycle consumes roughly 6.5 liters per 100 kilometers of road--not so little according to current thinking: the Oka automobile being prepared for manufacture consumes roughly about the same. The filling stations are not encountered on the road as often as one would like. And not all of them await

me with open arms: one is just for official transport, another without oil (I'm not even talking about the needed type of oil--just not grease), the third has an ill-starred tank--a bucket...

Therefore today I carry oil with me. And having traveled a hundred kilometers, all of my thoughts are on finding a refill. Will I be able to refill the tank or will I not make it to the station this time? How about a bucket? I don't carry that with me.

Over this trip I checked out 12 stations in the cities of Obninsk, Naro-Fominsk, Istra and on the Kaluga, Minsk and Volokolamsk highways within a radius of 100 kilometers of Moscow. The situation was the same everywhere.

* * *

As the material was being prepared for this issue, a letter arrived from Dnepropetrovsk. Its author, A. Lyakhovich, writes: "Cyclists in our city are placed in the most difficult conditions... There is either no gasoline, or oil, or a bucket to mix them in. If they give you a bucket, it is a dirty one they use for garbage."

There seems to be no need for us to comment. We would like to hear some from the employees of USSR Goskomnefteprodukt, however.

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